FORM DS-219R2
(4-51)

TRANSMISSION LINE CONSTRUCTION CONTRACT

(LABOR AND MATERIAL)

U.S. DEPARTMENT OF AGRICULTURE

RURAL ELECTRIFICATION ADMINISTRATION

Form DS-219R2
(4-51)

806412

NOTICE AND INSTRUCTIONS TO BIDDERS

1. Sealed proposals for the construction, including the supply of necessary labor, materials and equipment, of a rural electric transmission project to be financed pursuant to a Loan Contract between _____ (hereinafter called the "Owner") and the United States of America by the Administrator of the Rural Electrification Administration, dated _____, 19___, and to be known as Project _____, which is to be part of the System known as _____, will be received by the Owner on or before _____o'clock ___M., _____ Time, _____, 19___, at its office, No. _____ at which time and place the proposals will be publicly opened and read.

2. The Project will be approximately _____ miles in length and located in _____ Counties, in the State of _____, all as more fully described in the Plans, Specifications and Construction Drawings therefor hereinafter referred to.

3. The Plans, Specifications and Construction Drawings together with all necessary forms and other documents for bidders may be obtained from the Owner, or from the Engineer_____ at the latter's office at No. _____ upon payment of ten dollars ($10), which payment will not be subject to refund. The Plans, Specifications and Construction Drawings may be examined at the office of the Owner or at the office of the Engineer. A copy of the Loan Contract may be examined at the office of the Owner. Each set of Plans, Specifications and Construction Drawings will have a serial number, given by the Engineer, and the number of each set with the name of the Purchaser will be recorded by the Engineer. Bids will be accepted only from the original purchasers or from some other qualified Bidder to whom such a set has been transferred by the original purchaser, provided that in the event of such transfer the Engineer shall receive from the original purchasers, at least forty-eight (48) hours prior to the scheduled bid opening, written notice of such transfer, together with the name of the party to whom the transfer has been made.

4. Proposals and all supporting instruments must be submitted on the forms furnished by the Owner and must be delivered in a sealed envelope addressed to the Owner. The name and address of the Bidder, its license number if a license is required by the State, and the date and hour of the opening of bids must appear on the envelope in which

the Proposal is submitted, Proposals must be filled in ink or typewritten. No alterations or interlineations will be permitted, unless made before submission, and initialed and dated.

5. Prior to the submission of the Proposal the Bidder shall make and shall be deemed to have made a careful examination of the site of the Project and of the Plans, Specifications, Construction Drawings, Description of Assembly Units, and forms of Construction Agreement and Contractor's Bond on file with the Secretary of the Owner and with the Engineer, and shall become informed as to the location and nature of the proposed construction, the transportation facilities, the kind and character of soil and terrain to be encountered, the kind of facilities required before and during the construction of the Project, general local conditions and all other matters that may affect the cost and the time of completion of the Project. Bidders will be required to comply with all applicable statutes, regulations, etc., including those pertaining to the licensing of contractors, and the so-called "Kick-back Statute" (48 Stat. 948) and regulations issued pursuant thereto.

6. Each Bidder shall include and shall be deemed to have included, in the price quoted in the Contractor's Proposal for each Assembly Unit, the amounts which it is estimated will be payable by the successful Bidder or by the Owner on account of taxes imposed by any taxing authority upon the sale, purchase or use of materials, supplies or equipment incorporated in the Project as part of such Assembly Unit. All taxes of the foregoing descriptions shall be payable by the Bidder which shall be awarded the Contract for the construction of the Project.

7. A Bidder who has not already completed a line construction contract for an REA borrower, shall file with the Engineer the Bidder's Qualifications on forms supplied by the Engineer, at least forty-eight (48) hours in advance of the scheduled bid opening.

8. The Owner reserves the right to confine its consideration of the several bids to one type of design regardless of alternate types of design which may be specified in the Plans and Specifications and offered in the Proposals.

9. In estimating the least cost to the Owner as one of the factors in deciding the award of the Contract the Owner will consider, in addition to the bid prices of the various assembly units, the experience and responsibility of the Bidder.

10. The time of completion of the Project shall be as specified by the Engineer.

11. Each Proposal must be accompanied by a bid bond or a certified check on a bank that is a member of the Federal Deposit Insurance Corporation, payable to the order of the Owner in an amount equal to five percent (5%) of the maximum bid price. If a Proposal is not accepted or if a Proposal is accepted and a Contract is executed and a satisfactory Contractor's Bond is furnished by the successful Bidder, the

bid bond or check will be returned in each instance within a period of thirty (30) days to the Bidder furnishing same; except that each Bidder agrees, provided its Proposal is one of the three low Proposals, that, by filing its Proposal together with such bid bond or check in consideration of the Owner's receiving and considering such Proposal, said Proposal shall be firm and binding upon each such Bidder and such bid bond or check shall be held by the Owner for a period not exceeding sixty (60) days from the date hereinabove set for the opening of Proposals.

12. The successful Bidder will be required to enter into a Contract with the Owner and to furnish a Contractor's Bond in the form attached hereto with sureties listed by the United States Treasury Department as Acceptable Sureties, in a penal sum not less than the Contract price.

13. Should the successful Bidder fail or refuse to execute a Contract and to furnish a Contractor's Bond within ten (10) days after written notification of the award of the Contract by the Owner, the Bidder will be considered to have abandoned the Proposal and the amount of the certified check or other security delivered with the Proposal shall thereupon be due and owing to the Owner as liquidated damages for such failure or refusal and the Owner may thereupon award the Contract to any other Bidder. The term "successful Bidder" shall be deemed to include any Bidder whose Proposal is accepted after another Bidder has previously refused or has been unable to execute the Contract or to furnish a satisfactory Contractor's Bond.

14. The Contract, when executed, shall be deemed to include the entire agreement between the parties thereto, and the Contractor shall not claim any modification thereof resulting from any representation or promise made at any time by any officer, agent or employee of the Owner or by any other person.

15. The Owner reserves the right to waive minor irregularities or minor errors in any Proposal, if it appears to the Owner that such irregularities or errors were made through inadvertence. Any such irregularities or errors so waived must be corrected on the Proposal in which they occur prior to the execution of any Contract which may be awarded thereon.

16. The Owner reserves the right to reject any or all Proposals. The attention of Bidders is specially called to the desirability of a proper balance between prices for labor and materials and between the total prices for the respective Assembly Units. Lack of such balance may be considered as a reason for rejecting a Proposal.

17. Where the unit prices in the Contractor's Proposal are separated into three columns designated as "Labor," "Materials" and "Labor and Materials," and where a discrepancy appears between the sum shown in the "Labor and Materials" column and the correct addition of

the sums appearing in the "Labor" column and the "Materials" column, the correct addition of the sums appearing in the "Labor" column and the "Materials" column shall control.

18. The terms "Administrator," "Engineer," "Supervisor," "Contractor's Proposal," "Project" and "Completion" as used throughout this contract shall be defined in the Construction Agreement, Article VI, Section 1.

19. The Owner represents:

(a) If by other provisions of the contract documents the Owner shall have undertaken to furnish any materials for the construction of the Project, such materials are on hand at locations which may be determined by inquiry by bidders from the Engineer or if such materials are not on hand they will be made available by the Owner to the successful bidder before the time such materials are required for construction.

(b) All easements and rights-of-way, except as shown on maps included in the Plans and Specifications, have been obtained from the owners of the properties across which the Project is to be constructed (including tenants who may reasonably be expected to object to such construction).

(c) All staking, except as shown on the maps included in the Plans and Specifications, has been completed and sufficient staking crews will be available to maintain stakes at all times in advance of construction.

(d) The Owner will have available all funds necessary for immediate payment for the construction of the Project.

If the Owner shall fail to comply with any of the undertakings contained in the foregoing representations or if any of such representations shall be incorrect, the Contractor will be entitled to extension of time of completion for a period equal to the delay, if any, caused by the failure of the Owner to comply with such undertaking or by any such incorrect representation; provided the Contractor shall have promptly notified the Owner in writing of its desire

to extend the time of completion in accordance with the foregoing, and provided further that such extension, if any, of the time of completion shall be the sole remedy of the Bidder for the Owner's failure to comply with any of the foregoing representations.

_____
Owner

By_____

_____, 19_____

CONTRACTOR'S PROPOSAL

(Proposal shall be submitted in ink or typewritten)

To:

_____

_____
(hereinafter called the "Owner").

1. The undersigned (hereinafter called the "Bidder") hereby proposes to construct the rural electric transmission project _____

_____
in strict accordance with the Plans, Specifications and Construction Drawings therefor, attached hereto and made a part hereof, and to furnish all materials, machinery, tools, equipment, labor, transportation and other means necessary therefor, for the prices hereinafter stated:

Section 1 - POLE UNITS

Species of Timber_____
Type of Treatment (Pressure retention in lbs.)_____
Type of Preservative_____

Unit No.	No. of Units	Unit Price			Extended Price- Labor and Materials
		Labor	Materials	Labor and Materials	

Total, Section 1_____

Section 12 - POLE TOP ASSEMBLY UNITS

Unit No.	No. of Units	Unit Price			Extended Price-Labor and Materials
		Labor	Materials	Labor and Materials	
TP					
TP					
TP					
TP					
TP					
TS					
TS					
TS					
TS					
TS					
TS					
TH					
TH					
TH					
TH					
TH					

Total, Section 12 _____

Section 3 - CONDUCTOR ASSEMBLY UNITS

Unit No.	No. of Units	Unit Price			Extended Price- Labor and Materials
		Labor	Materials	Labor and Materials	
*					

Total, Section 3 _____

* Use manufacturer's designation.

Section 4 - GUY ASSEMBLY UNITS

Unit No.	No. of Units	Unit Price			Extended Price-Labor and Materials
		Labor	Materials	Labor and Materials	
TG-1					
TG-2					
TG-3					
TG-4					
TG-5					

Total, Section 4 _____

Section 5 - ANCHOR ASSEMBLY UNITS

Unit No.	No. of Units	Unit Price			Extended Price-Labor and Materials
		Labor	Materials	Labor and Materials	
TA-1-5					
TA-1-8					
TA-2					

Total, Section 5 _____

Section 6 - MISCELLANEOUS ASSEMBLY UNITS

Unit No.	No. of Units	Unit Price			Extended Price- Labor and Materials
		Labor	Materials	Labor and Materials	
TM-					
TM-					
TM-					
TM-					

Total, Section 6 _____

SECTION 7 - RIGHT-OF-WAY CLEARING UNITS

Unit No.	No. of Units	Unit Price	Extended Price-Labor Only
TM-12			
TM-13			

Total, Section 7 _____

SECTION 8 - SUBSTATION ASSEMBLY UNITS

Unit No.	No. of Units	Unit Price			Extended Price-Labor and Materials
		Labor	Materials	Labor and Materials	
S1					
S2					
S3					

Total, Section 8 _____

LIGHTNING ARRESTERS

Station type or line type _____

Rated voltage _____

RATING OF TRANSFORMERS, PRIMARY CUTOUTS, AND SWITCHES

TRANSFORMERS

Number	KVA	Primary Voltage	Secondary Voltage	Rated KVA taps	
				Percent below	Percent above

PRIMARY CUTOUTS

Rating _____

Type _____

SWITCHES

Rating _____

Type _____

PROPOSAL SUMMARY

Recapitulation of Sections:

Section - 1	_____	_____
Section - 2	_____	_____
Section - 3	_____	_____
Section - 4	_____	_____
Section - 5	_____	_____
Section - 6	_____	_____
Section - 7	_____	_____
Section 8	_____	_____
Total	_____	_____

2. The Bidder further agrees to furnish and use in the construction of the Project under this Proposal, in the event the Contract is awarded to the Bidder, only such materials and equipment as are included in the current "List of Materials Acceptable for Use on REA-Financed Systems," including revisions adopted prior to the Bid Opening.

Poles, anchor logs, pole keys, stubs, and crossarms will be treated by _____
_____
at _____
and will be inspected by _____
_____ of _____

Other materials will be obtained from Suppliers and Manufacturers as specified below; both of which shall be named. Where the names of more than one Supplier or one Manufacturer are given for the same group of materials, the item letters applicable to each Supplier or Manufacturer shall be specified.

MATERIAL	SUPPLIER	MANUFACTURER
Hardware		
(Includes items *b, c, d, f, h, i, j, n, o, aa, ab, ac, ad, al, ao, ba, bb, bi, cr, cs, ct, cu, dd, du, dx, dz, eb, ed, ef, eg, ek, em.)	_____	_____
	_____	_____
	_____	_____
	_____	_____
Protective Equipment and Switches		
(Includes items ae, af, ag, ax, be, cg, cl, co.)	_____	_____
	_____	_____
	_____	_____
	_____	_____
Anchors, Guy Wire, and Accessories		
(Includes items u, v, x, z, at, bj, bk, ck.)	_____	_____
	_____	_____
	_____	_____
	_____	_____
Poles, Crossarms		
(Includes items g, au.)	_____	_____
	_____	_____
	_____	_____

MATERIAL	SUPPLIER	MANUFACTURER
Conductor Accessories		
(Includes items l, m, p, ap, bl, bm, bn, bo, ci, cp, cq, cx, cy, cz, dp, ei, ej)		
Transformers		
(Includes item an)		
Ground Rods and Ground Rod Clamps		
(Includes items ai, aj)		
Conductors		
Insulators and Insulator Hardware		
(Includes items a, k, q, r, s, w, ar, as, bh, bs, cf, cm, ea, eh)		

* Note: The item letters shown above correspond to those given in the "List of Materials Acceptable for Use on REA-Financed Systems."

3. The Bidder understands and agrees that the various Assembly Units on which bids are made in this Proposal are as set out in the "Description of Assembly Units" attached hereto and made a part hereof, that all said bids are on a unit basis, and that the Owner may specify any number or combination of Assembly Units that the Owner, with the approval of the Administrator of the Rural Electrification Administration (hereinafter called the "Administrator"), may deem necessary for the construction of the Project.

4. The Bidder has made a careful examination of the site of the Project to be constructed and of the Plans, Specifications, Construction Drawings, Description of Assembly Units and forms of Construction Agreement and Contractor's Bond on file with the Secretary of the Owner and with the Engineer, and has become informed as to the location and nature of the proposed construction, the transportation facilities, the kind and character of soil and terrain to be encountered, and the kind of facilities required before and during the construction of the Project, and has become acquainted with the labor conditions which would affect work on the proposed construction.

5. The Bidder agrees that the prices for poles set forth herein shall include the cost of preservative treatment and inspection in accordance with the "Specifications for the Treatment and Inspection of Treated Timber Purchased by Rural Electrification Administration Borrowers" and that the Bidder will supply certified treated poles in accordance therewith, such certification to be furnished to the Owner by the successful bidder at the time of delivery of the poles to the site of the Project.

6. The Bidder agrees to make such changes in construction previously installed in the Project by the Bidder as required by the Owner on the following basis:

The cost of labor shall be the reasonable cost thereof but in no event shall it exceed two (2) times the actual cost to the Bidder of the direct labor, as shown on a certified copy of his payroll, employed in making the change. Such reasonable cost shall be in lieu of any other payment for the installation and removal of the original unit but shall not include the cost of the installation, if any, of a new or replacing unit, payment for which shall be made at the unit price as quoted in the Proposal. No payment shall be made to the Bidder for materials or labor involved in correcting mistakes or omissions on the part of the Bidder which result in construction not in accordance with the Plans and Specifications.

7. The Bidder also agrees that when it is necessary to construct units not shown in the Proposal it will construct such units for a price arrived at as follows:

The cost of materials shall be determined by the invoices.

The cost of labor shall be determined by calculating the ratio of the total labor costs to the total material costs in the section of the Proposal involved, then multiplying the cost of materials for the unit in question by this ratio.

8. This Proposal is made pursuant to the provisions of the Notice and Instructions to Bidders attached hereto and the Bidder agrees to the terms and conditions thereof.

9. The Bidder warrants that it possesses Contractor's License No. _____ for the State of _____ in which the Project is located and said license expires on _____ _____, 19 ____. (Omit, if no license is required).

10. The Bidder warrants that this Proposal is made in good faith and without collusion or connection with any person or persons bidding for the same work.

11. The Bidder agrees that in the event this Proposal is accepted it will execute a Contract in the form on file with the Secretary of the Owner and that if awarded the Contract it will make available for use in connection with the proposed construction:

(a) All necessary tools and equipment.

(b) Qualified superintendents and foremen.

12. The Bidder warrants that it possesses adequate financial resources and agrees that in the event this Proposal is accepted it will furnish a Contractor's Bond in the form on file with the Secretary of the Owner and in a penal sum not less than the maximum Contract price, with a surety or sureties listed by the United States Treasury Department as Acceptable Sureties.

In the event that the surety or sureties on the performance bond delivered to the Owner contemporaneously with the execution of the Contract or on any bond or bonds delivered in substitution therefor or in addition thereto shall at any time become unsatisfactory to the Owner or the Administrator, the Bidder agrees to deliver to the Owner another or an additional bond.

13. The Bidder agrees to commence construction of the Project within thirty (30) calendar days after written notice by the Administrator of the approval of the Construction Contract and further agrees to prosecute diligently and to complete construction in strict accordance with the Plans, Specifications and Construction Drawings within _____ (____) calendar days "(excluding Saturdays, Sundays and legal holidays)" after the expiration of such 30 day period. Provided, however, that the Bidder will not be required to dig holes, set poles or install anchors if there are more than six (6) inches of frost in the ground nor to perform any construction on such days when in the judgement of the Engineer snow, rains, or wind, or the results

of snow, rain, or frost make it impracticable to perform any operation and to the extent of the time lost due to the conditions described herein and approved in writing by the Engineer, the time of completion set out above will be extended. The Bidder will nevertheless work on other items of construction if weather conditions do not seriously hamper such other construction.

14. The unit prices for Assembly Units in this Contractor's Proposal include provisions for the payment of all moneys which will be payable by the Bidder or the Owner in connection with the construction of the Project on account of taxes imposed by any taxing authority upon the sale, purchase or use of materials, supplies or equipment to be incorporated in the Project as part of such Assembly Units. The Bidder agrees to pay all such taxes and to furnish to the appropriate taxing authorities all required information and reports pertaining thereto.

15. The Bidder understands and agrees that the quantities called for in this Proposal are approximate, and that the total number of units upon which payment shall be made shall be as set forth in the inventory based on the Engineer's structure list, both of which shall be subject to approval by the Administrator.

(Name of Bidder) _____

_____

(By) _____

(Title of Officer) _____

_____

(Address of Bidder) _____

_____

(Date) _____

(The Proposal must be signed with the full name of the Bidder. In the case of a partnership the Proposal must be signed in the firm name by each partner. In the case of a corporation the Proposal must be signed in the Corporate name by a duly authorized officer and the Corporate seal affixed and attested by the Secretary of the Corporation. A typewritten copy of all such names and signatures shall be appended.)

DESCRIPTION OF ASSEMBLY UNITS

For Use in Preparing Contractor's Proposal

1. All bids are to be made on a unit basis so that the Engineer may specify any combination of construction units that he may deem necessary. The various construction units that are included in this Proposal, and upon which quotations are required, are defined by the following symbols and descriptions:

2. Pole unit. - First two digits - length of pole. Third digit - classification per A. S. A. (Example: 45-3 means a pole 45 feet long, class 3). A pole unit in the Proposal consists of one pole in place. It does not include the pole top assembly unit or other parts attached to the pole.

3. The Proposal is based on each unit in place and includes only the materials listed on the corresponding Construction Drawings. The following assembly units are designated for each different arrangement which may be used in the construction of the Project:

4. Pole top assembly unit. - Consists of the hardware, crossarms and their appurtenances, insulators, etc., except tie wire, required to support the power conductors and overhead ground wire. It does not include the pole, the downlead and butt coil, which are separate units.

5. Guy assembly unit. - Consists of the hardware and wire. Guy guards are designated separately.

6. Anchor assembly unit. - Consists of the anchor with rod or rods, complete, ready for attaching the guy wire.

7. Conductor and overhead ground wire assembly unit. - Consists of 1,000 feet of a single conductor or overhead ground wire, and includes tie wire, sleeves for splicing, and armor rods with clips or armor wire where necessary. The length of conductor or overhead ground wire shall be determined by taking the sum of all straight horizontal span distances between pole stakes or from center to center of the poles carrying the conductors. The conductor sizes listed are the manufacturer's designation.

8. Miscellaneous assembly unit. - Consists of all additional units needed in the Project for line construction but not otherwise listed in the Proposal.

9. Clearing right-of-way unit. - Consists of clearing 1,000 feet of right-of-way, the number of feet in width as designated by the Engineer.

10. Substation assembly unit. - Consists of the complete substation ready for connection of the line conductors, as shown on the substation drawing.

The Contractor's Proposal form is divided into sections and the sections approved for construction shall be listed in the Construction Agreement by the Owner. These sections are as follows:

Section 1. - Pole units.
Section 2. - Pole top assembly units.
Section 3. - Conductor assembly units.
Section 4. - Guy assembly units.
Section 5. - Anchor assembly units.
Section 6. - Miscellaneous assembly units.
Section 7. - Clearing right-of-way units.
Section 8. - Substation assembly units.

SECTION 2 - POLE TOP ASSEMBLY UNITS

Pin-Type and Post-Type Structures -- 46 kv Maximum

TP-1 . . . . . Tangent pin-type structure, single arm
TP-2 . . . . . Tangent pin-type structure, double arm
TP-3 . . . . . Tangent post-type structure, single arm
TP-4 . . . . . Tangent post-type structure, double arm
TP-5 . . . . . Tangent pin-type structure with overhead groundwire
TP-6 . . . . . Tangent pin-type structure, double circuit

Suspension-Type Structures -- 69 kv Maximum

TS-1 . . . . . Tangent, single-pole suspension structure, single arm
TS-1B. . . . . Small angle, single-pole suspension structure, single arm-bracket
TS-2 . . . . . Tangent, single-pole suspension structure, double arm
TS-3 . . . . . Medium angle, vertical suspension structure with brackets
TS-3G. . . . . Medium angle, vertical suspension structure with brackets--overhead groundwire
TS-4 . . . . . Large angle, vertical suspension structure
TS-4G. . . . . Large angle, vertical suspension structure, with overhead groundwire
TS-5 . . . . . 50° - 90° dead end, vertical suspension structure
TS-5G. . . . . 50° - 90° dead end, vertical suspension structure, with overhead groundwire
TS-6 . . . . . Tangent, single-pole, double-circuit suspension structure
TS-7 . . . . . Tangent, single-pole suspension structure, with brackets

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H-Frame Structures -- 69 kv Maximum -- 10'-6" Conductor Separation

TH-1 . . . . . Tangent, H-frame suspension structure
TH-1G. . . . . Tangent, H-frame suspension structure, with overhead groundwire
TH-1B. . . . . Tangent, H-frame suspension structure, with brackets
TH-1BG . . . . Tangent, H-frame suspension structure, with brackets and overhead groundwire
TH-2 . . . . . Dead end, H-frame structure
TH-2G. . . . . Dead end, H-frame structure, with overhead groundwire
TH-3 . . . . . Medium angle, three-pole structure, with overhead groundwire
TH-4 . . . . . Large angle, three-pole structure, with overhead groundwire
TH-5 . . . . . Dead end, three-pole structure, with overhead groundwire
TH-6 . . . . . Medium angle, H-frame suspension structure, with overhead groundwire

H-Frame Structures -- 115 kv Maximum -- 12'-6" Conductor Separation With Overhead Groundwire

TH-1A. . . . . Tangent, H-frame suspension structure
TH-2A. . . . . Dead end, H-frame structure
TH-3A. . . . . Medium angle, three-pole structure
TH-4A. . . . . Large angle, three-pole structure
TH-5A. . . . . Dead end, three-pole structure

SECTION 3 - CONDUCTOR AND OVERHEAD GROUND WIRE ASSEMBLY UNITS

Each conductor or overhead ground wire assembly unit shall be listed in accordance with the manufacturer's designation as to size and type.

SECTION 4 - GUY ASSEMBLY UNITS

TG-1 . . . . . Single Guy
TG-2 . . . . . Double Guy to one rod
TG-3 . . . . . Double Guy to two rods
TG-4 . . . . . Overhead Guy
TG-5 . . . . . Metal guy guard, 8 feet long

SECTION 5 - ANCHOR ASSEMBLY UNITS

TA-1-5 . . . . . Anchor Assembly, 5' log
TA-1-8 . . . . . Anchor Assembly, 8' log
TA-2 . . . . . Rock Anchor

SECTION 6 - MISCELLANEOUS ASSEMBLY UNITS

TM-1 . . . . . Guide--suspension insulator strings
TM-2 . . . . . Guide--overhead ground suspension assembly
TM-2A. . . . . Guide--overhead ground dead end assembly
TM-3 . . . . . Sectionalizing switch structure, 69-kv maximum
TM-4 . . . . . Pole framing for TP-1
TM-4A. . . . . Pole framing for TH-1
TM-5 . . . . . Pole framing for TS-1
TM-5A. . . . . Pole framing for TH-1G and TH-1A
TM-9 . . . . . Pole-grounding assembly
TM-9A. . . . . Two-pole tie assembly
TM-12. . . . . Clearing Right-of-way guide
TM-12-1. . . . . Clearing Right-of-way guide
TM-12-2A . . . . Guide-Measuring Right-of-way clearing units
TM-13. . . . . Clearing Right-of-way guide
TM-20. . . . . Crossarm drilling guide for pin type structures
TM-21. . . . . Crossarm drilling guide for single pole suspension structures
TM-22. . . . . Crossarm drilling guide for H-frame structures with 10'-6" conductor spacing
TM-23. . . . . Crossarm drilling guide for H-frame structures with 12'-6" conductor spacing

SECTION 7 - RIGHT-OF-WAY CLEARING UNITS

TM-12 Right-of-Way Clearing Unit

The unit, for purpose of quoting, is 1000 feet in length and _____ feet in width (to be measured _____ feet on one side of pole line or centerline of structures) of actual clearing of right-of-way. This includes clearing of underbrush, tree removal and such tree trimming as may be required to leave an unobstructed right-of-way from the ground up on one side of the line of poles carrying conductors. (See Clearing Right-of-Way Guide, Detail "A", Drawing TM-12-2A).

The length of actual clearing shall be measured in a straight line parallel to the line between poles or centerline of structures and across the maximum dimension of foliage cleared (not trunk) projected to the ground line. (See Clearing Right-of-Way Guide, Detail "B", Drawing TM-12-2A).

All trees and underbrush across the width of the right-of-way shall be considered to be grouped together as a single length in measuring the total length of clearing. (See Clearing Right-of-Way Guide, Detail "C", Drawing TM-12-2A.)

Spaces along the right-of-way in which no trees are to be removed or trimmed or underbrush cleared shall be omitted from the total measurement. All length thus arrived at, added together and divided by 1000, shall give the number of 1000-foot TM-12 units of clearing. The contractor shall not remove or trim shade, fruit or ornamental trees unless so directed by the Engineer in writing.

TM-12 (1) Right-of-Way Clearing Unit

This unit is identical with TM-12, except the full width of the right-of-way to be cleared shall be _____ feet wide (to be measured _____ feet on each side of the pole line or centerline of structures). (See Clearing Right-of-Way Guide Detail "D", Drawing TM-12-2A.)

TM-13 Right-of-Way Clearing Unit

The unit, for purpose of quoting, is 1000 feet in length of clearing off the right-of-way. This unit includes the removal or topping of danger trees at the option of the Contractor. Danger trees are considered to be those which will reach within five feet of a point underneath the outside conductor in falling. Such trees will be designated by the Engineer in writing. (See Clearing Right-of-Way Guide, Drawing TM-12-2A.)

The measurement of length of right-of-way to be cleared shall be considered as a straight line parallel to the line between poles or centerline of structures, such measurement of length to be based on maximum dimension of foliage (not trunk) projected to the ground line. (See Clearing Right-of-Way Guide Detail "E", "F", "G", and "H", Drawing TM-12-2A.)

Dead trees having no foliage shall be measured across the maximum dimension and multiplied by two. (See Clearing Right-of-Way Guide Detail "F", Drawing TM-12-2A.) Each tree so removed shall be added together to determine the total length of clearing. All length thus arrived at, added together and divided by 1000, shall give the number of TM-13 units. (Example: Detail E. F. G. and H. Drawing TM-12-2A total .1 of a TM-13 unit.)

CONSTRUCTION AGREEMENT

Contract dated this _____ day of _____, 19___, by and between _____ _____ (hereinafter called the "Owner"), a corporation organized and existing under the laws of the State of _____ and _____ _____ (hereinafter called the "Contractor"), (an individual) (a partnership) (a corporation) organized and existing under the laws of the State of _____ . (Strike out descriptions that do not apply.)

WHEREAS, the United States of America (hereinafter called the "Government") by the Administrator of the Rural Electrification Administration has entered into a loan contract (hereinafter called the "Loan Contract") with the Owner providing for a loan to the Owner for the construction of a rural electric transmission project designated by the Rural Electrification Administration as Project _____ _____ _____;

NOW, THEREFORE, in consideration of the mutual undertakings herein contained, the parties hereto agree as follows:

ARTICLE I - ACCEPTANCE OF PROPOSAL

Section 1. - Acceptance.

The Owner accepts the Contractor's Proposal and the parties hereto agree that the Assembly units which shall be used in the construction of the Project, and to which the Unit Prices as set forth in said Proposal shall apply, are as follows, and that the materials which shall be used in the construction of the Project shall be as set forth in said Proposal with exceptions as appended thereto.

Assembly units:

Sections: _____ _____ _____ _____

For a more detailed description of said Assembly Units and materials reference shall be had to the Material and Construction Specifications, Construction Drawings and Plans, and Description of Assembly Units contained in or accompanying the Contractor's Proposal.

Section 2. - Description of Contract.

The Notice and Instructions to Bidders, the Proposal, Description of Assembly Units, Materials and Construction Specifications, Construction Drawings and Plans are hereby by reference incorporated herein and together with the Construction Agreement constitute the Contract.

ARTICLE II - CONSTRUCTION

Section 1. - Time and Manner of Construction.

(a) The time for completion hereinbefore in the Contractor's Proposal set forth shall be extended for the period of any reasonable delay which is due exclusively to causes beyond the control and without the fault of the Contractor, including acts of God, fires, floods, and acts or omissions of the Owner with respect to matters for which the Owner is solely responsible: Provided, however, that no such extension of time for completion shall be granted the Contractor unless within ten (10) days after the happening of any event relied upon by the Contractor for such an extension of time the Contractor shall have made a request therefor in writing to the Owner, and provided further that no delay in such time of completion or in the progress of the work which results from any of the above causes or from any changes in construction which may be made pursuant to subsection (c) of this Section 1 shall result in any liability on the part of the Owner.

(b) The sequence of Construction shall be as set forth below, the numbers being the designation of line sections corresponding to the numbers on the maps attached hereto, or if no line sections are set forth below, the sequence of construction shall be as determined by the Contractor.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(c) The Owner, acting through the Engineer and with the approval of the Administrator, may from time to time during the progress of the construction of the Project make such changes, additions to or subtractions from the Plans, Specifications, Construction Drawings and List of Materials which are part of the Contractor's Proposal as conditions may warrant: Provided, however, that if any substantial change in the construction to be done shall require an extension of time, a reasonable extension will be granted if the Contractor shall make a written request therefor to the Owner within ten (10) days after any such change is made and provided further that if the cost to the

Contractor shall be materially increased by any such change or addition, the Owner shall pay the Contractor for the reasonable cost thereof in accordance with a construction contract amendment signed by the Owner and the Contractor and approved by the Administrator, but no claim for additional compensation for any such change or addition will be considered unless the Contractor shall have made a written request therefor to the Owner prior to the commencement of work in connection with such change or addition.

Section 2. - Supervision and Inspection.

(a) The Contractor shall cause the construction work on the Project to receive constant supervision by a competent superintendent (hereinafter called the "Superintendent") who shall be present at all times during working hours where construction is being carried on. The Contractor shall also employ, in connection with the construction of the Project, capable, experienced and reliable foremen and such skilled workmen as may be required for the various classes of work to be performed. Directions and instructions given to the Superintendent by the Engineer shall be binding upon the Contractor.

(b) The Owner reserves the right to require the removal from the Project of any employee of the Contractor if in the judgment of the Engineer such removal shall be necessary in order to protect the interest of the Owner. The Engineer or the Supervisor, if any, shall have the right to require the Contractor to increase the number of his employees and to increase or change the amount or kind of tools and equipment if at any time the progress of the work shall be unsatisfactory to the Engineer or Supervisor; but the failure of the Engineer or Supervisor to give any such directions shall not relieve the Contractor of his obligations to complete the work within the time and in the manner specified in this Contract.

(c) The manner of construction of the Project, and all materials and equipment used therein, shall be subject to the inspection, tests and approval of the Engineer and the Administrator, and the Contractor shall furnish all information required by the Engineer or by the Administrator concerning the nature or source of any materials incorporated or to be incorporated in the Project. The Owner and the Administrator shall have the right to inspect all pay rolls, invoices of materials, and other data and records of the Contractor and of any subcontractor, relevant to the construction of the Project. The Contractor shall provide all reasonable facilities necessary for such inspection and tests and shall maintain an office at the site of the Project, with telephone service where obtainable and at least one office employee to whom directions and instructions of the Engineer may be delivered. Delivery of such directions or instructions in writing to the employee of the Contractor at such office shall constitute delivery to the Contractor.

(d) In the event that the Owner, or the Administrator, shall determine that the construction contains or may contain numerous defects, it shall be the duty of the Contractor and the Contractor's surety or

sureties to have an inspection made by an engineer approved by the Owner and the Administrator for the purpose of determining the exact nature, extent and location of such defects.

(e) The Engineer, shall have the authority to suspend the work wholly or in part for such period or periods as the Engineer may deem necessary due to unsuitable weather or such other conditions as are considered unfavorable for the satisfactory prosecution of the work or because of the failure of the Contractor to comply with any of the provisions of the Contract: Provided, however, that the Contractor shall not suspend work pursuant to this provision without written authority from the Engineer so to do. The time of Completion hereinabove set forth shall be increased by the number of days of any such suspension, except when such suspension is due to the failure of the Contractor to comply with any of the provisions of this Contract. In the event that work is suspended by the Contractor with the consent of the Engineer, the Contractor before resuming work shall give the Engineer at least twenty-four (24) hours notice thereof in writing.

Section 3. - Defective Workmanship and Materials.

(a) The acceptance of any workmanship, materials, or equipment by the Engineer shall not preclude the subsequent rejection thereof if such workmanship, materials or equipment shall be found to be defective after delivery or installation, and any such workmanship, materials or equipment found defective before final acceptance of the construction shall be remedied or replaced, as the case may be, by and at the expense of the Contractor. Any condemned material or equipment shall be immediately removed from the site of the Project by the Contractor at the Contractor's expense. The Contractor shall not be entitled to any payment hereunder so long as any defective workmanship, materials or equipment in respect to the Project, of which the Contractor shall have had notice, shall not have been remedied or replaced, as the case may be.

(b) Notwithstanding any certificate which may have been given by the Engineer, if any workmanship, material or equipment which does not comply with the requirements of this Contract shall be discovered within one (1) year after completion of the Project the Contractor shall remedy any such defective workmanship or replace such defective materials or equipment within thirty (30) days after notice in writing of the existence thereof shall have been given by the Owner. If the Contractor shall be called upon to remedy defective workmanship or replace any defective materials or equipment as herein provided, the Owner, if so requested by the Contractor, shall de-energize that section of the Project involved in such work. In the event of failure by the Contractor so to do, the Owner may remedy such defective workmanship or replace such defective materials or equipment, as the case may be, and in such event the Contractor shall pay to the Owner the cost and expense thereof.

ARTICLE III - PAYMENTS AND RELEASE OF LIENS

Section 1. - Payments to Contractor.

(a) Within the first fifteen (15) days of each calendar month, the Owner shall make partial payment to the Contractor for construction accomplished during the preceding calendar month on the basis of completed Assembly Units furnished and certified to by the Contractor, and approved by the Engineer solely for the purposes of payment: Provided, however, that such approval by the Engineer shall not be deemed approval of the workmanship or materials. Only ninety percent (90%) of each such estimate approved during the construction of the Project shall be paid by the Owner to the Contractor prior to Completion of the Project. Upon completion by the Contractor of the construction of the Project, the Engineer will prepare a final inventory of the Project showing the total number and character of Assembly Units and, after checking such Inventory with the Contractor, will certify it to the Administrator, together with a certificate of the total cost of the construction performed. Upon the approval of such certificates by the Administrator, the Owner shall make payment to the Contractor of all amounts to which the Contractor shall be entitled thereunder which shall not have been paid. No payment shall be due while the Contractor is in default in respect of any of the provisions of this Contract and the Owner may, withhold from the Contractor the amount of any claim by a third party against either the Contractor or the Owner based upon an alleged failure of the Contractor to perform the work hereunder in accordance with the provisions of this Contract.

(b) The Contractor shall be paid on the basis of the number of Assembly Units actually installed at the direction of the Engineer, as shown by the inventory based on the Engineer's structure lists, which shall be subject to approval by the Administrator: Provided, however, that the total cost shall not exceed the maximum Contract price for the construction of the Project as computed from the Proposal, unless such excess shall have been approved in writing by the Administrator.

It is understood and agreed that this maximum Contract price is _____ dollars ($_____). Subject to the above proviso it is agreed that the number of such units may be greater or less than the estimated number based upon the Plans and Specifications and the size of the Project as originally contemplated, and the Contractor shall not be entitled to any claim for damages on account of any reasonable additions to or subtractions from the Project, or of any delay occasioned thereby, or of any changes in the routing of the lines.

(c) Notwithstanding the provisions of Section 1(a) above, the Contractor may, by giving written notice thereof to the Owner, elect to receive payment in full for any section of the Project upon:

(i) completion of construction of such section as certified by the Engineer and approved by the Administrator;
(ii) submission to the Owner and the Administrator of the releases of lien and the affidavit referred to in Section 2 hereof;

(iii) approval by the Administrator of the Final Inventory in respect of such section; and

(iv) submission to the Owner and the Administrator of the consent in writing by the Surety or Sureties on the Contractor's Bond to payment in full for such section prior to completion of the Project.

(d) Interest at the rate of six percent (6%) per annum shall be paid by the Owner to the Contractor on all unpaid balances due on monthly estimates, commencing fifteen (15) days after the due date, and on the final payment for the Project or any completed section thereof, commencing thirty (30) days after the due date; provided the delay in payment beyond the due date is not caused by any condition within the control of the Contractor.

Section 2 - Release of Liens. (See sample form, Waiver and Release of Lien)

Upon the completion by the Contractor of the construction of the Project (or any section thereof if the Contractor shall elect to receive payment in full for any section when completed as provided above) but prior to payment to the Contractor of any amount in excess of ninety percent (90%) of the total cost of all Assembly Units comprising the completed Project or such section as certified by the Engineer, the Contractor shall deliver to the Owner, in duplicate, releases of all liens and of rights to claim any lien, in the form attached hereto from all manufacturers, materialmen, and subcontractors furnishing services or materials for the Project or such section and an affidavit in the form attached hereto to the effect that all labor used on or for the Project or such section has been paid and that all such releases have been submitted to the Owner; and the Owner shall deliver to the Administrator for the Administrator's approval one of the duplicates of each such release and affidavit.

Section 3. - Payments to Materialmen and Subcontractors. (See sample of Affidavit of Contractor, Page 32.

The Contractor shall pay each materialman, and each subcontractor, if any, within five (5) days after receipt of any payment from the Owner, the amount thereof allowed the Contractor for and on account of materials furnished or construction performed by each materialman or each subcontractor.

[SAMPLE]

WAIVER AND RELEASE OF LIEN

WHEREAS, the undersigned, _____
(Name of manufacturer, materialman, or subcontractor)

has furnished to _____ the following:
(Name of contractor)

_____ for use in the construction
(Kind of material and services furnished)

of an electrical transmission and distribution Project belonging to _____,
(Name of owner)

and designated by the Rural Electrification Administration as Project, _____
(REA designation)

NOW, THEREFORE, the undersigned _____
(Name of manufacturer, materialman, or subcontractor)

for and in consideration of $_____, and other good and valuable consideration, the receipt whereof is hereby acknowledged, do(es) hereby waive and release any and all liens, or right to or claim of lien, on the above-described Project and premises, under any law, common or statutory, on account of labor or materials, or both, heretofore or hereafter furnished by the undersigned to or

for the account of said _____ for said Project.
(Name of contractor)

Given under my(our) hand(s) and seal(s) this _____ day of _____, 19____

_____
(Name of manufacturer, materialman, or subcontractor)

By _____
(President, vice president, partner or owner, or, if signed by other than one of foregoing, accompanied by power of attorney signed by one of the foregoing in favor of the signer.) (Use designation applicable.)

STATE OF _____ }
} *ss:*
COUNTY OF _____ }

I, _____, a notary public, in and for said State and county,

hereby certify that _____ whose name as
(Name of deponent)

_____ of _____
(Title of office) (Name of manufacturer, materialman, or subcontractor)

is signed to the foregoing instrument, and who is known to me, acknowledges before me on this day that he, with full authority, executed the foregoing instrument voluntarily for and as the act of said

_____
(Name of manufacturer, materialman, or subcontractor)

Given under my hand and seal this _____ day of _____, 19____

_____
Notary Public.

My commission expires _____, 19____

[SAMPLE]

AFFIDAVIT OF CONTRACTOR

STATE OF _____
} ss:
COUNTY OF _____

_____, being duly sworn according to law, deposes and

says that he is the _____ of _____
(Title of office) (Name of contractor)

the Contractor, in a construction contract entered into between the Contractor and _____

_____, the Owner, for the construction
(Name of REA borrower)

of a rural electrical transmission and distribution Project, which Project bears the Rural

Electrification Administration Project designation _____; and
(REA designation)

that he is authorized to and does make this affidavit on behalf of said Contractor in order to induce the Rural Electrification Administration to advance moneys to the Owner for the purpose of payment by the Owner to the Contractor and to induce the Owner to make payment to the Contractor, in accordance with the provisions of the said construction contract.

Affiant further says that all persons who have furnished labor in connection with the construction of the Project, have been paid in full; that the names of *all* manufacturers, materialmen, and subcontractors that furnished any material or services or both in connection with such construction and the kind or kinds of material or services or both so furnished are:

Name	*Kind of material and service*

and that the Contractor has delivered to the Owner duplicate releases of liens executed by all such manufacturers, materialmen, and subcontractors.

_____
(Signature of affiant)

Sworn to and subscribed before me this _____ day of _____, 19____

_____
Notary Public.

My commission expires _____, 19____

ARTICLE IV - PARTICULAR UNDERTAKINGS OF THE CONTRACTOR

Section 1. - Protection to Persons and Property.

The Contractor shall at all times take all reasonable precautions for the safety of employees on the work and of the public, and shall comply with all applicable provisions of Federal, State, and Municipal safety laws and building and construction codes. All machinery and equipment and other physical hazards shall be guarded in accordance with the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America unless such instructions are incompatible with Federal, State, or Municipal laws or regulations.

The following provisions shall not limit the generality of the above requirements:

(a) The Contractor shall at no time and under no circumstances cause or permit any employee of the Contractor to perform any work upon energized lines, or upon poles carrying energized lines, unless otherwise specified in the Notice and Instruction to Bidders.

(b) The Contractor shall so conduct the construction of the Project as to cause the least possible obstruction of public highways.

(c) The Contractor shall provide and maintain all such guard lights and other protection for the public as may be required by applicable statutes, ordinances and regulations or by local conditions.

(d) The Contractor shall do all things necessary or expedient properly to protect any and all parallel, converging and intersecting lines, joint line poles, highways and any and all property of others from damage, and in the event that any such parallel, converging and intersecting lines, joint line poles, highways or other property are damaged in the course of the construction of the Project the Contractor shall at its own expense restore any or all of such damaged property immediately to as good a state as before such damage occurred.

(e) Where the right-of-way of the Project traverses cultivated lands the Contractor shall limit the movement of his crews and equipment so as to cause as little damage as possible to crops, orchards or property, and shall endeavor to avoid marring the lands. All fences which are necessarily opened or moved during the construction of the Project shall be replaced in as good condition as they were found and precautions shall be taken to prevent the escape of livestock. The Contractor shall be responsible for any losses of stock or damage to crops, orchards or property caused by construction of the Project.

(f) The Project, from the commencement of work to completion, or to such earlier date or dates when the Owner may take possession and control in whole or in part as hereinafter provided shall be under the charge and control of the Contractor and during such period of control

by the Contractor all risks in connection with the construction of the Project and the materials to be used therein shall be borne by the Contractor. The Contractor shall make good and fully repair all injuries and damages to the Project or any portion thereof under the control of the Contractor by reason of any act of God or other casualty or cause whether or not the same shall have occured by reason of the Contractor's negligence. The Contractor shall hold the Owner harmless from any and all claims for injuries to persons or for damage to property happening by reason of any negligence on the part of the Contractor or any of the Contractor's agents or employees during the control by the Contractor of the Project or any part thereof.

(g) Any and all excess earth, rock, debris, underbrush and other useless material shall be removed by the Contractor from the site of the Project as rapidly as practicable as the work progresses.

(h) Upon violation by the Contractor of any of the provisions of this section, after written notice of such violation given to the Contractor by the Engineer or the Owner, the Contractor shall immediately correct such violation. Upon failure of the Contractor so to do the Owner may correct such violation at the Contractor's expense: Provided, however, that the Owner may, if it deems it necessary, advisable, correct such violation at the Contractor's expense without such prior notice to the Contractor.

(i) The Contractor shall submit to the Owner monthly reports in duplicate of all accidents, giving such data as may be prescribed by the Engineer.

(j) The Contractor shall not proceed with the cutting of trees or clearing of right-of-way without written notification from the Engineer that proper authorization has been received from the owner of the property, and the Contractor shall promptly notify the Engineer whenever any land-owner objects to the trimming or felling of any trees or the performance of any other work on his land in connection with the Project and shall obtain the consent in writing of the Engineer before proceeding in any such case.

Section 2. - Delivery of Possession and Control to Owner.

Upon written request of the Owner approved in writing by the Administrator the Contractor shall deliver to the Owner full possession and control of any section of the Project provided the Contractor shall have been paid at least ninety percent (90%) of the cost of construction of such section. Upon such delivery of the possession and control of any section of the Project to the Owner the risks and obligations of the Contractor as set forth in Article IV, Section 1 (f) hereof with respect to such section of the Project so delivered to the Owner shall be terminated: Provided, however, that nothing herein contained shall relieve the Contractor of any liability with respect to defective workmanship or materials as contained in Article II, Section 3 hereof.

Section 3. - Energizing the Project.

(a) Prior to completion of the Project the Owner, upon written notice to the Contractor approved in writing by the Administrator, may test the construction thereof by temporarily energizing any section or sections thereof. During the period of such test the section or sections of the Project so energized shall be considered as within the possession and control of the Owner and governed by the provisions of Section 2 of this Article. Upon completion of such test and upon de-energizing the lines involved therein said section or sections of the Project shall be considered as returned to the possession and control of the Contractor unless the Owner shall elect to continue possession and control in the manner provided in Section 2 of this Article.

(b) The Owner shall have the right to energize permanently any section or sections of the Project delivered to its possession and control pursuant to the provisions of Section 2 of this Article.

Section 4. - Insurance

The Contractor shall take out and maintain throughout the construction period insurance satisfactory to the Administrator in the following minimum requirements:

(a) Workmen's compensation insurance covering all employees in statutory limits who perform any of the obligations assumed by the Contractor under the contract.

(b) Public liability and property damage liability insurance covering all operations under the contract: limits for bodily injury or death not less than $50,000 for one person and $100,000 for each accident; for property damage, not less than $10,000 for each accident and $25,000 aggregate for accidents during the policy period.

(c) Automobile liability insurance on all self-propelled vehicles used in connection with the contract, whether owned, non-owned, or hired; public liability limits of not less than $50,000 for one person and $100,000 for each accident; property damage limit of $5,000 for each accident.

The Owner shall have the right at any time to require public liability insurance and property damage liability insurance greater than those required in subsections (b) and (c) of this section. In any such event, the additional premium or premiums payable solely as the result of such additional insurance shall be added to the contract price.

Upon request by the Administrator, the Contractor shall furnish to the Administrator a certificate in such form as the Administrator may prescribe evidencing compliance with the foregoing requirements.

Section 5. - Purchase of Materials.

The Contractor shall purchase all materials and supplies outright and not subject to any conditional sales agreement, bailment lease or other agreement reserving to the seller any right, title or interest therein. All materials and supplies shall become the property of the Owner when erected in place.

Section 6. - Assignment of Guarantees.

All guarantees of materials and workmanship running in favor of the Contractor shall be transferred and assigned to the Owner on completion of construction and at such time as the Contractor receives final payment.

Section 7. - Patent Infringement.

The Contractor shall save harmless and indemnify the Owner from any and all claims, suits and proceedings for the infringement of any patent or patents covering any materials or equipment used in construction of the Project.

Section 8. - Permits for Explosives.

All permits necessary for the handling or use of dynamite or other explosives in connection with the construction of the Project shall be obtained by and at the expense of the Contractor.

Section 9. - Compliance with Statutes and Regulations.

The Contractor shall comply with all applicable statutes, ordinances, rules, and regulations pertaining to the construction of the Project, including but not limited to,applicable regulations of the Office of Defense Mobilization, National Production Authority, Defense Production Administration, Economic Stabilization Agency, Office of Price Stabilization and Wage Stabilization Board.

Section 10. - Prevailing Wages.

The wage rates for persons employed in the construction of the Project shall be not less than the following:

Classification	Hourly Wage Rate
Carpenter	
Cement Finisher	
Concrete Mixer Operator	
Earth Boring Machine Operator	
Electrician (Outside)	
Electrician's Helper	
Groundman	
Iron Worker	
Jackhammer Operator	
Laborer	
Lineman, 1st Class	
Lineman, App., First Year	
Lineman, App., Second Year	
Lineman, App., Third Year	
Lineman, App., Fourth Year	
Powderman	
Tractor Operator	
Tree Trimmer	
Truck Driver	
_____	
_____	
_____	
_____	
_____	
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_____	

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The foregoing are prevailing wage rates for the area and are the minimum rate which may be paid. They are not to be construed as maximum or fixed rates.

The Contractor shall cause all subcontractors performing work on the contract to pay wages not less than those determined to be prevailing by the Department of Labor, and as set forth in this Section.

The Contractor shall post copies of the provisions of this Section in such form and in such places and during such times as the Owner, with the approval of the Administrator, shall request. The Contractor shall also give to his employees such additional notice of the provisions of this Section as the Owner, with the approval of the Administrator, shall request.

The Contractor shall submit to the Owner, with each monthly or other periodic estimate of work completed for purposes of securing payment under the contract, a certificate as to compliance with the provisions of this Section in respect of all work performed under the contract prior to the date of such certificate. The submission of such certificate shall be a condition precedent to payment by the Owner of sums otherwise due under the contract. Upon completion of the construction of the Project, but prior to the payment to the Contractor of any sums in excess of 90% of the Contract Price, the Contractor will submit to the Owner and to the Administrator an affidavit in such form as the Owner, with the approval of the Administrator, shall prescribe to the effect that all employees engaged in the performance of the work have been paid in accordance with wage rates not less than those set forth in this Section.

ARTICLE V - REMEDIES

Section 1. - Completion on Contractor's Default.

If default shall be made by the Contractor or by any subcontractor in the performance of any of the terms of this Contract, the Owner, without in any manner limiting its legal and equitable remedies in the circumstances, may serve upon the Contractor and the Surety or Sureties upon the Contractor's Bond or Bonds a written notice requiring the Contractor to cause such default to be corrected forthwith. Unless within twenty (20) days after the service of such notice upon the Contractor such default shall be corrected or arrangements for the correction thereof satisfactory to both the Owner and the Administrator shall be made by the Contractor or its Surety or Sureties, the Owner may take over the construction of the Project and prosecute the same to completion by Contract or otherwise for the account and at the expense of the

Contractor, and the Contractor and its Surety or Sureties shall be liable to the Owner for any cost or expense in excess of the contract price occasioned thereby. In such event the Owner may take possession of and utilize, in completing the construction of the Project, any materials, tools, supplies, equipment, appliances, and plant belonging to the Contractor or any of its subcontractors, which may be situated at the site of the Project. The Owner in such contingency may exercise any rights, claims or demands which the Contractor may have against third persons in connection with this Contract and for such purpose the Contractor does hereby assign, transfer and set over unto the Owner all such rights, claims and demands.

Section 2. - Liquidated Damages.

The time of the Completion of the construction of the Project is of the essence of this Contract. Should the Contractor neglect, refuse or fail to complete the construction within the time herein agreed upon, after giving effect to extensions of time, if any, herein provided, then, in that event and in view of the difficulty of estimating with exactness damages caused by such delay, the Owner shall have the right to deduct from and retain out of such moneys which may be then due, or which may become due and payable to the Contractor the sum of _____ dollars ($_____) per day for each and every day that such construction is delayed in its Completion beyond the specified time, as liquidated damages and not as a penalty; if the amount due and to become due from the Owner to the Contractor is insufficient to pay in full any such liquidated damages, the Contractor shall pay to the Owner the amount necessary to effect such payment in full; Provided, however, that the Owner shall promptly notify the Contractor in writing of the manner in which the amount retained, deducted or claimed as liquidated damages was computed.

Section 3. - Cumulative Remedies.

Every right or remedy herein conferred upon or reserved to the Owner or the Government or the Administrator shall be cumulative, shall be in addition to every right and remedy now or hereafter existing at law or in equity or by statute and the pursuit of any right or remedy shall not be construed as an election: Provided, however, that the provisions of Section 2 of this Article V shall be the exclusive measure of damages for failure by the Contractor to complete the construction of the Project within the time herein agreed upon.

ARTICLE VI - MISCELLANEOUS

Section 1. - Definitions.

(a) The term "Administrator" as used herein shall mean the Administrator of the Rural Electrification Administration of the United States of America and his duly authorized representatives or any other person in whom or authority in which may be vested the duties and functions which the Administrator is now authorized by law to perform.

(b) The term "Engineer" shall mean the engineer employed by the Owner, with the approval of the Administrator, to supervise the construction of the Project, and said Engineer's duly authorized assistants and representatives.

(c) The term "Supervisor" shall mean the person, if any, appointed by the Administrator as the representative of the Government under the provisions of the Loan Contract providing for such appointment in special cases. The term is limited to such special representative of the Government, if any, who is responsible exclusively to the Administrator and does not refer to the Superintendent or any other person employed by the Owner and responsible to it.

(d) The term "Contractor's Proposal" shall mean the proposal of the Contractor, including all accompanying documents as therein referred to, a copy of which is attached to and made a part hereof, and upon which the award of this Contract was made.

(e) The term "Project" shall mean the rural electric transmission system, or portion thereof, described in the Plans and Specifications, Construction Drawings and Maps attached hereto.

(f) The term "Completion" shall mean full performance by the Contractor of the Contractor's obligations under this Contract and all amendments and revisions thereof. A certificate of Completion, stating the date of completion, signed by the Engineer and approved in writing by the Administrator, shall be the sole and conclusive evidence as to the fact of completion and the date thereof. Portions of the Project shall be deemed to be completed, within the meaning of this provision, when they have been completely erected, and have been inspected and accepted in writing, by the Engineer on behalf of the Owner. Thereafter such completed sections may be energized in accordance with the provisions of Article IV, Section 3, at which time the Contractor's liability for maintaining them will cease.

Section 2. - Materials and Supplies.

In the performance of this Contract there shall be used only such unmanufactured articles, materials and supplies as have been mined or produced in the United States, and only such manufactured articles, materials and supplies as have been manufactured in the United States substantially all from articles, materials, or supplies mined, produced, or manufactured, as the case may be, in the United States: Provided, that foreign articles, materials or supplies may be used in the event and to the extent that the Administrator shall expressly in writing authorize such use pursuant to the provisions of the Rural Electrification Act of 1938, being Title IV of Public Resolution No. 122, 75th Congress, approved June 21, 1938. The Contractor agrees to submit to the Owner such certificate or certificates, signed by the Contractor and all subcontractors, with respect to compliance with the foregoing provision as the Administrator from time to time may require.

Section 3. - Nonassignment of Contract.

The Contractor shall perform directly and without subcontracting not less than twenty-five per centum (25%) of the construction of the Project, to be calculated on the basis of the total Contract price. The Contractor shall not assign this Contract or any interest in any funds that may be due or become due hereunder or enter into any Contract with any person, firm or corporation for the performance of the Contractor's obligations hereunder or any part thereof, without the approval in writing of the Owner and the Administrator and of the Surety and Sureties on any bond furnished by the Contractor for the faithful performance of the Contractor's obligations hereunder. If the Contractor, with the consent of the Owner, the Administrator and any Surety or Sureties on the Contractor's Bond or Bonds, shall enter into a subcontract with any subcontractor for the performance of any part of this Contract, the Contractor shall be as full responsible to the Owner and the Government for the acts and omissions of such subcontractor and of persons employed by such subcontractor as the Contractor would be for its own acts and omissions and those of persons directly employed by it.

Section 4. - Antidiscrimination.

The Contractor shall not discriminate against any employee or applicant for employment because of race, creed, color or national origin.

Section 5. - "Kick-Back Statute."

The Contractor acknowledges that it is familiar with the Rural Electrification Act of 1936 as amended by the Rural Electrification Act of 1938, the so-called "Kick-back Statute" (48 Stat. 948) and all regulations issued pursuant thereto, and Section 35 of the United States Criminal Code as amended, and the Contractor agrees to comply with the provisions of all of said statutes and regulations. The Contractor shall furnish an affidavit in the form attached hereto and made a part hereof and shall preserve a copy of the Contractor's payroll for three years from the date of completion, as required by the regulations issued under the "Kick-back" Statute.

Section 6. - Franchises and Rights-of-Way.

The Contractor shall be under no obligation to obtain or assist in obtaining: Any franchises, authorizations, permits or approvals required to be obtained by the Owner from Federal, State, County, Municipal or other authorities; any rights-of-way over private lands; or any agreements between the Owner and third parties with respect to the joint use of poles, crossings, or other matter incident to the construction and operation of the Project.

Section 7. - Extension to Successors and Assigns.

Each and all of the covenants and agreements herein contained shall extend to and be binding upon the successors and assigns of the parties hereto.

Section 8. - Approval of this Contract by the Administrator.

This Contract shall become effective only upon the approval in writing of the Administrator: Provided, however, that no obligations shall arise hereunder unless such approval is given within forty-five (45) days from the date of execution by the parties as indicated herein.

IN WITNESS WHEREOF, the parties hereto have caused this Contract to be signed in their respective corporate names by their Presidents and their seals to be hereunto affixed and attested by their Secretaries, all as of the day and year first above written.

Attest: _____
Owner

_____ By _____
Secretary President

Attest: _____
Contractor

_____ By _____
Secretary President

(This form is to be used when the Contractor is a corporation)

IN WITNESS WHEREOF, The Owner has caused this Contract to be signed in its corporate name by its President and its corporate seal to be hereunto affixed and attested by its Secretary, and the Contractor(s) has (have) hereunto set his (their) hand(s), all as of the day and year first above written.

Attest:

_____
Secretary

_____
Owner

By_____
President

_____

_____

_____
Contractor

(This form to be used when the Contractor is an individual or a partnership. If a partnership, all partners shall sign).

SAMPLE AFFIDAVIT

STATE OF .....

COUNTY OF .....

I, ..., ...,
(Name of party signing affidavit) (Title)

being duly sworn, do depose and say: That I pay or supervise the payment of the persons employed by ....., on the .....:
(Contractor or subcontractor) (Building or work)

That during the pay-roll period commencing on the ..... day of .....,

19....., and ending the ..... day of ....., 19....., all persons on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said .....
(Contractor or subcontractor)

from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full weekly wages earned by any person, other than permissible deductions, as defined in the regulations under the "Kick-Back" Act (48 Stat. 948) and described below:

.....
(Signature and title)

Sworn to before me this .....

day of ....., 19.....

CONTRACTOR'S BOND

1. Know all men that we, _____, as Principal, and _____, as Surety, are held and firmly bound unto _____ (hereinafter called the "Owner") and unto the United States of America (hereinafter called the "Government") and unto all persons, firms and corporations who or which may furnish materials for or perform labor on a Rural Electrification Administration Project known as Project _____ and to their successors and assigns, in the penal sum of _____ dollars ($_____), as hereinafter set forth and for the payment of which sum well and truly to be made we bind ourselves, our executors, administrators, successors and assigns jointly and severally by these presents. Said Project is described in a certain construction contract (hereinafter called the "Construction Contract") between the Owner and the Principal, dated _____, 19____, pursuant and subject to a certain loan contract (hereinafter called the "Loan Contract") between the Owner and the Government, acting through the Administrator of the Rural Electrification Administration (hereinafter called the "Administrator").

2. The condition of this obligation is such that if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of the Construction Contract and any amendments thereto, whether such amendments are for additions, decreases, or changes in materials, their quantity, kind or price, labor costs, mileage, routing or any other purpose whatsoever, and whether such amendments are made with or without notice to the Surety, and shall fully indemnify and save harmless the Owner and the Government from all costs and damages which they, or either of them, shall suffer or incur by reason of any failure so to do, and shall fully reimburse and repay the Owner and the Government for all outlay and expense which they, or either of them shall incur in making good any such failure of performance on the part of the Principal, and shall promptly make payment to all persons working on or supplying labor or materials for use in the construction of the Project contemplated in the Construction Contract and any amendments thereto, in respect of such labor or materials furnished and used therein, to the full extent thereof, and in respect of such labor or materials furnished but not so used, to the extent of the quantities estimated in the Construction Contract and any amendments thereto to be required for the construction of the Project, and shall well and truly reimburse the Owner and the Government, as their respective interests may appear, for any excess in cost of construction of said Project over the cost of such construction as provided in the Construction Contract and any amendments thereto, occasioned by any default of the Principal under the Construction Contract and any amendments thereto, then this obligation shall be null and void, but otherwise shall remain in full force and effect.

3. It is expressly agreed that this bond shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon any amendment to the Construction Contract, so as to bind the Principal and the Surety to the full and faithful performance of the Construction Contract as so amended, provided only that the total amount of all increases in the cost of construction shall not exceed 20 percent of the amount of the maximum price set forth in the Construction Contract. The term "Amendment," wherever used in this bond, and whether referring to this bond, the Construction Contract or the Loan Contract, shall include any alteration, addition, extension, modification, amendment, rescission, waiver, release or annulment, of any character whatsoever.

4. It is expressly agreed that any amendment which may be made by agreement or otherwise between the Principal and the Owner in the terms, provisions, covenants and conditions of the Construction Contract, or in the terms, provisions, covenants and conditions of the Loan Contract (including, without limitation, the granting by the Administrator to the Owner of any extension of time for the performance of the obligations of the Owner under the Loan Contract or the granting by the Administrator or the Owner to the Principal of any extension of time for the performance of

the obligations of the Principal under the Construction Contract, or the failure or refusal of the Administrator or the Owner to take any action, proceeding or step to enforce any remedy or exercise any right under either the Construction Contract or the Loan Contract, or the taking of any action, proceeding or step by the Administrator or the Owner, acting in good faith upon the belief that the same is permitted by the provisions of the Construction Contract or the Loan Contract) shall not in any way release the Principal and the Surety, or either of them, or their respective executors, administrators, successors or assigns, from liability hereunder. The Surety hereby acknowledges receipt of notice of any amendment, indulgence or forebearance, made, granted or permitted.

5. This bond is made for the benefit of all persons, firms and corporations who or which may furnish any materials or perform any labor for or on account of the construction to be performed under the Construction Contract and any amendments thereto, and they, and each of them, are hereby made obligees hereunder with the same force and effect as if their names were written herein as such, and they and each of them may sue hereon.

In witness whereof, the undersigned have caused this instrument to be executed and their respective corporate seals to be affixed and attested by their duly authorized representatives this

_____day of _____, 19_____.

_____ (SEAL)
(Principal)

Attest: By _____

_____ _____
(Secretary)

_____ (SEAL)
(Surety)

Attest: By _____

_____ _____
(Secretary)

By _____
(Resident Agent of Surety)

_____

(The Contractor's Bond must be signed with the full name of the Contractor. If the Contractor is a partnership the Contractor's Bond must be signed in the partnership name by each partner. If the Contractor is a corporation the Contractor's Bond must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the corporation. A typewritten copy of all such names and signatures shall be appended.

(The Contractor's Bond must be accompanied by a power of attorney authorizing execution on behalf of the Surety and, in jurisdictions so requiring should be countersigned by a duly authorized resident agent of the Surety.)

MATERIAL AND CONSTRUCTION SPECIFICATIONS
FOR
RURAL ELECTRICAL TRANSMISSION SYSTEM

These Specifications are divided into two parts for convenience and reference as follows:

Part I. - Specifications for Materials.
Part II.- Specifications for Construction.

The Plans and Specifications are presumably correct but extreme accuracy is not guaranteed. Notes, figures and writing on the Plans must be strictly followed as they constitute a part of the Plans and Specifications. Should any error or ambiguity be discovered in the Plans or in the Specifications the Contractor shall report the same to the Engineer before starting the work.

The latest revision of the National Electrical Safety Code shall be followed in every case except where local regulations are more stringent. Grade B construction shall be used throughout.

PART I - SPECIFICATIONS FOR MATERIALS

General.

This part of the Specifications describes the types, sizes and characteristics of the various materials required for the construction of the complete rural electrical transmission project as shown on the Plans and Construction Drawings.

Poles.

Poles shall be of the kind, length and A.S.A. class specified in the Proposal. They shall be Western Red Cedar, Northern White Cedar, Southern Yellow Pine, Douglas Fir, Lodgepole Pine or any acceptable equivalent of the same classification. The framing and branding shall be in accordance with the Construction Drawings attached hereto. Machine or hand-trimmed poles are acceptable.

The physical characteristics and dimensions, method of treatment, type of preservative, instructions on inspection and general procedure applying to all poles shall be in accordance with the "Specifications for Treatment and Inspection of Treated Timber Purchased by REA Borrowers."

All poles treated full length must be bored, roofed and gained before treatment.

All poles and the entire treating process, including heat conditioning when used, shall be inspected for full compliance with these Specifications, by a pole inspector satisfactory to the Owner and the Administrator. The Owner reserves the right to reject at the treating

plant or at the destination such poles as do not conform to these Specifications, if such condition is demonstrated by examination and pole borings at said plant or destination.

Anchor Logs.

The physical characteristics, method of treatment, type of preservative, instructions on inspection and general procedure applying to all log anchors shall be in accordance with the "Specifications for the Treatment and Inspection of Treated Timber Purchased by REA Borrowers" which apply to poles of the same kind of timber. Dimensions and borings shall conform to drawings or instructions attached hereto. They shall be bored as required before treatment.

Crossarms.

All cross arms shall be treated Douglas Fir or treated Southern Yellow Pine, furnished in accordance with "REA Transmission Line Cross Arm Specifications." Dimensions shall be in accordance with the Construction Drawings attached hereto. Treatment shall be in accordance with "Specifications for the Treatment and Inspection of Treated Timber Purchased by REA Borrowers."

Insulators.

Each insulator shall be marked with the initials or trademark of the manufacturer. Marking shall be plainly legible and durable.

All insulators for transmission lines shall conform to the A. I. E. E. Standards for Insulators.

The design of the insulator shall be such that breakage of the porcelain by arcs, rifle fire, or accidental causes cannot materially affect the mechanical strength of the insulator.

Suspension Insulators.

Suspension insulators shall have the following minimum ratings for physical and electrical dimensions and characteristics:

Type of connections	Standard ball and socket
Diameter	10 inches
Spacing	5-3/4 inches
Dry Flashover, 60 cycle	80 kv
Wet Flashover, 60 cycle	50 kv
Leakage distance	11-1/2 inches
Mechanical and electrical strength	15,000 pounds
Puncture, 60 cycle	110 kv
Mechanical impact strength	55-inch-pounds
Positive impulse	125 kv
Negative impulse	130 kv

Pintype Insulators.

Pintype insulators for transmission lines shall have top and side grooves with minimum radius of 3/8 inch, and shall be provided with zinc thimbles for 1-3/8 inch NEMA Standard Pin Thread. Insulators shall be two-piece units and shall have joints with sanded surfaces, treated with resilient compounds. They shall have the following minimum characteristics for grounded neutral systems:

	44 kv system	33 kv system
Dry flashover, 60 cycle	140 kv	125 kv
Wet flashover, 60 cycle	95 kv	85 kv
Puncture	185 kv	165 kv
Leakage distance	27 inches	21 inches
Positive impulse	225 kv	200 kv
Mechanical strength	3,000 pounds	3,000 pounds

Hardware.

Pins. - Steel pole-top and crossarm pins shall have 1-3/8 inch lead thread and a minimum strength of 1,500 pounds based on a 10° deflection. Crossarm pins to be furnished with square washers, nuts and locknuts.

Bolts and nuts. - Machine bolts, carriage bolts and double-arm bolts shall conform to E.E.I. Specification TD-1-1937 or any acceptable revision thereof. Eye bolts shall conform to E.E.I. Specification TD-4-1939 or any acceptable revision thereof. Lag screws shall conform to E.E.I. Specification TD-3-1938 or any acceptable revision thereof. All bolts shall be furnished with nuts and lock nuts. Bolts shall be long enough to accommodate the necessary nuts, washers, etc., without projecting more than 1-1/2 inches at the free end, except that they shall not project more than one-fourth inch into the eye where an eyenut is installed.

Steel. - Steel parts shall conform to A. S. T. M. Specification A-7-46 or any acceptable revision thereof.

Malleable iron. - Malleable iron parts shall conform to A. S. T. M. Specification A-47-47 or any acceptable revision thereof.

Galvanizing. - All steel and malleable iron parts shall be hot-dip galvanized, conforming to A. S. T. M. Specification A-153-47T or any acceptable revision thereof.

Guy Assembly.

Guy wire. - Guy wire shall be seven-strand 3/8 inch High Strength double galvanized cable, unless otherwise specified, conforming to all the latest revision of A. S. T. M. Specification A-122-41, or equivalent.

Anchor. - Anchors shall be as listed in the Construction Drawings. Anchor rods shall be provided with a twin thimble type eye, which shall not be separable from the rod. Anchor rods shall conform to E.E. I. Specification TD-2-1939 or any acceptable revision thereof.

Guy guard. - Guards shall be of the metal all-round type not less than 8 feet long and No. 18 gage minimum or of the metal half-round type not less than 8 feet long and No. 14 gage minimum.

Grounding Material.

Ground rod. - Rods shall be of hard-drawn copper, Copperweld or equivalent nonrusting material.

Ground rod and ground wire clamps. - Clamps shall be of copper, bronze or equivalent nonrusting material.

Ground Wire. - Wire shall be copper or other nonrusting material and shall have a conductivity of not less than No. 6 copper as specified on construction drawings.

Staples. - Staples for ground wire shall be galvanized steel or equivalent.

Conductors.

All conductors shall be bare and in accordance with the requirements of the National Electrical Safety Code for Grade B construction as follows:

Conductor shall be of material or combinations of material which will not corrode excessively under the prevailing conditions.

Copper wire and copper cable shall be in accordance with the latest acceptable revisions of the A. S. T. M. specifications.

Overhead ground wire-steel wire and steel cable shall be in accordance with A. S. T. M. Specification A-218-41 or any acceptable revision thereof. The weight of zinc coating may be Class A, Class B, or Class C, where applicable. The use of conductor type overhead ground wire is also permitted where applicable.

Other conductors shall be in accordance with specifications approved by the Engineer and the Administrator.

Accessories for conductors. - Accessories for conductors shall be as recommended by the conductor manufacturers.

Jumpers shall be of the same material as the branch line.

Brass shall not be used for clips or connectors.

Air Break Switches.

Gang operated air break disconnect switches shall comply with the latest NEMA Power Switching Equipment Standards.

PART II - SPECIFICATIONS FOR CONSTRUCTION

General.

All construction work shall be done in a thorough and workmanlike manner in accordance with the Plans, Specifications and Construction Drawings, and shall be subject to the acceptance of the Engineer and the Administrator.

Deviations from the Plans, Specifications and Construction Drawings shall not be permitted except upon the written permission of the Engineer given with the approval of the Administrator.

Scope.

The Plans and Specifications cover the construction of a rural electrical transmission system known as Rural Electrification Administration Project _____

_____

which consists approximately of the following:

_____

_____

_____

_____

_____

The project is located in the county or counties of _____

_____

_____ State(s) of _____

All of the above is included within the terms of the Loan Contract.

Drawings and Maps.

The Vicinity Map showing the general route of the transmission line or lines, and showing sections of the line covered by each Plan and Profile sheet is listed separately hereinafter and is part of these Plans and Specifications and no deviation from the Plan and Profile drawings shall be made without the written approval of the Administrator. The Construction Drawings, including the Plan and Profile and structure lists, showing the type of construction to be used where indicated on the Plan and Profile, also are listed separately hereinafter and are part of these Plans and Specifications.

946698 O--51--5

Locations of Structures.

Structures, guys, etc., shall be placed in locations determined by the engineer and staked by the engineer as shown on the Plan and Profile sheets and structure lists. Structures, guys, etc., shall not be erected in any other location without prior approval of the engineer.

Wood Poles.

In distributing poles, extra heavy, choice, close-grained poles shall be reserved for angles, crossings, and dead ends.

For single pole structures the minimum setting depths shall be as follows:

Pole length (in feet)	Setting depth (in feet)
35	6.0
40	6.0
45	6.5
50	7.0
55	7.5
60	8.0
65	8.5
70	9.0
75	9.5

For multiple pole structures, holes shall be carefully dug to the setting depth specified by the engineer, except that the distance from the butt to the gain shall be measured for each pole and the depth of holes adjusted as required. If necessary the top of one pole of a multiple pole structure shall be cut and reframed to bring crossarms level.

On sloping ground, the depth of the hole shall always be measured from the low side of the hole.

Holes shall be approximately 8 inches larger than the butt diameter of the pole, and shall be at least as large at the bottom as at the top.

All poles shall be set in alignment except on line angles, and plumb. At line angles, where suspension construction is used, poles shall be offset on the bisector of the angle so that conductors will hang directly over the point of intersection or in line with the tangent in both directions. All poles shall be plumb after conductors are strung.

In backfilling, holes shall be thoroughly tamped the full depth. Earth shall be banked up around each pole. After completion of the job, holes shall be inspected and any settlement refilled.

Where new gains or holes are required in fir, pine, and full length treated cedar poles, the gains shall be painted with creosote compound and holes pressure treated with creosote compound using a pressure gun.

The tops of full length treated poles shall not be cut except under very exceptional conditions and upon approval of the engineer. If cutting is deemed necessary, the pole top shall be painted with creosote compound and covered completely with a copper cap plate.

Under no circumstances shall the butt of any pole be cut.

All unused holes in poles shall be plugged prior to erection, using treated wood dowel pins. For holes in used poles where the hole has been enlarged, the hole will be pressure treated with creosote compound using a pressure gun prior to plugging.

Guys and Anchors.

Guys shall be installed in locations specified by the engineer. Points of attachment to poles shall be as shown on construction drawings. Guys shall be installed before conductors or overhead ground wires are strung.

Holes for anchor logs shall be dug in locations staked by the engineer. Anchor rods shall be in line with the strain and so installed that approximately twelve inches of the rod shall remain out of the ground. Under no circumstances shall the eye of the rod be covered. Holes shall be backfilled and tamped in the same manner as for pole holes. The setting of each anchor as regards depth and position shall be inspected by the Engineer and the engineer's approval given in writing before the anchor hole shall be backfilled.

Insulators.

Care shall be exercised in handling and erecting insulators and in assembling suspension units to insure that all cotter keys are in place.

Conductors and Overhead Ground Wires.

Care shall be exercised to avoid kinking, twisting, or abrading the conductor or overhead ground wire in any manner. Conductors or overhead ground wires shall not be tramped on, run over by vehicles or dragged over sharp rocks. The wire on each reel shall be inspected for cuts, kinks or other injuries. Injured portions or crooked or imperfect splices in either the conductor or overhead ground wire shall be cut out and the wire respliced.

Conductors and overhead ground wires shall be pulled over suitable rollers or stringing blocks properly mounted on the pole or crossarm, to prevent binding while stringing.

Installation of conductors and accessories shall be done in accordance with manufacturers recommendations.

With pin-type insulators the conductors shall be tied in the top groove of the insulator on tangent poles and on the side of the insulator away from the strain at angles. Pin-type insulators shall be tight on the pins and on tangent construction the top groove must be in line with the conductor after tying in.

There shall not be more than one splice per conductor in any span, and no splice shall be located within 10 feet of the conductor support.

Utmost care shall be exercised in installing parallel groove clamps. The contact surface of the clamp and the wire shall be clean and bright. A steel brush shall be the principal cleaning medium. Bolts shall be brought down hard, but the threads must not be overstressed. These same precautions for cleaning also shall apply to the conductor before splicing.

Conductors and overhead ground wires shall be sagged in accordance with sag and tension charts or tables furnished by the engineer. The sag of all conductors after stringing shall be in accordance with the Conductor Manufacturers recommendations, except that a maximum increase of 3 inches of the specified sag in any span will be acceptable: Provided, however, that required clearances are obtained; under no circumstances will a decrease in the specified sag be allowed. Sagging by sighting between targets is recommended.

The air temperature at the time and place of stringing shall be determined by a certified etched-glass thermometer. The temperature at which the conductor is sagged in and the spans in which sags are measured shall be recorded and the information given to the engineer.

Clearing Right-of-Way and Danger Trees.

In preparing the right-of-way, trees shall be removed, underbrush cleared, and trees trimmed so that the right-of-way, except for tree stumps which shall not exceed _____ in height, shall be clear from the ground up and of the width specified in the Proposal and Construction Agreement. Trees fronting each side of the right-of-way shall be trimmed symmetrically unless otherwise directed by the Engineer. Dead trees beyond the right-of-way which would strike the line in falling shall be removed. Leaning trees beyond the right-of-way which would strike the line in falling and which would require topping if not removed may be removed or topped at the option of the Contractor except that the Contractor shall trim and not remove shade, fruit, or ornamental trees unless otherwise directed by the Engineer.

Trees that are felled shall be cut to commercial wood lengths, stacked neatly, and left on the right-of-way for the landowner. Commercial wood length means the length designated by the Engineer but in no case shall it be required to be less than _____( ) feet. Brush, branches, and refuse shall, without delay, be disposed of by such of the following methods as the Engineer will direct:

(a) Burned

(Engineer to strike out methods not to be used)

(b) Removed from the vicinity of the right-of-way

(c) Piled on one side of the right-of-way in such a manner as not to obstruct roads, ditches, drains, etc.

_____ _____

Engineer Date

All right-of-way operations shall be carried out as directed by the Engineer in a manner to preserve symmetrical appearance in accordance with Construction Drawings.

Miscellaneous.

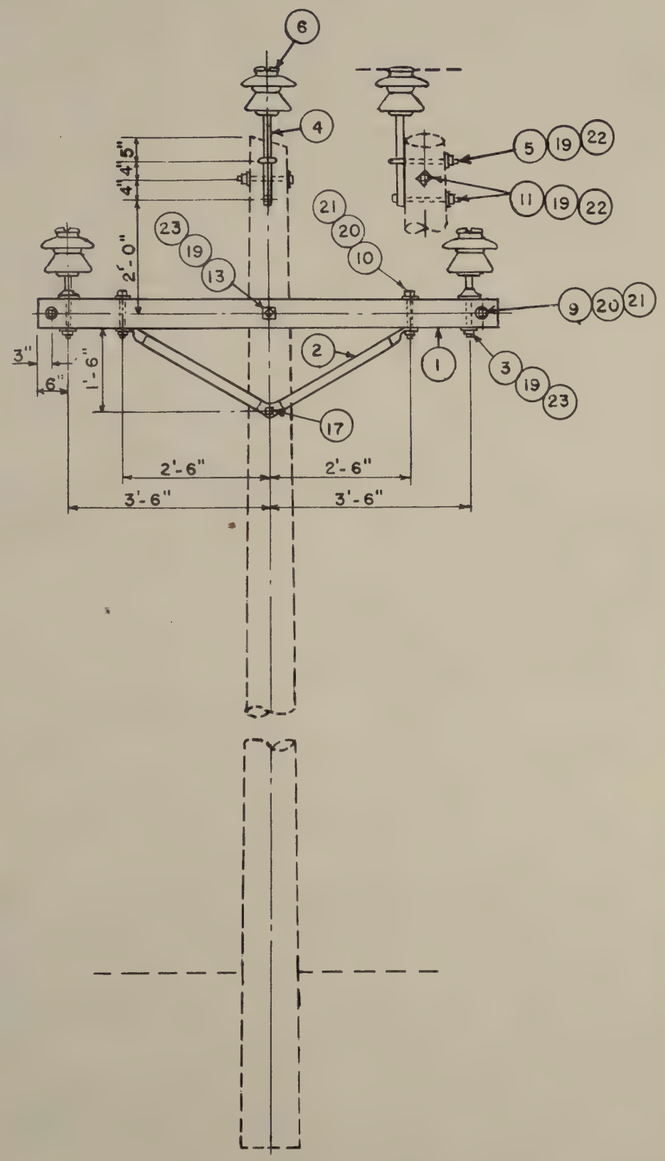
Sufficient safe, cool drinking water and an adequate first aid kit must be provided on each work truck. Adequate safety equipment and construction tools shall be provided by the contractor.

LIST OF CONSTRUCTION DRAWINGS AND PLANS

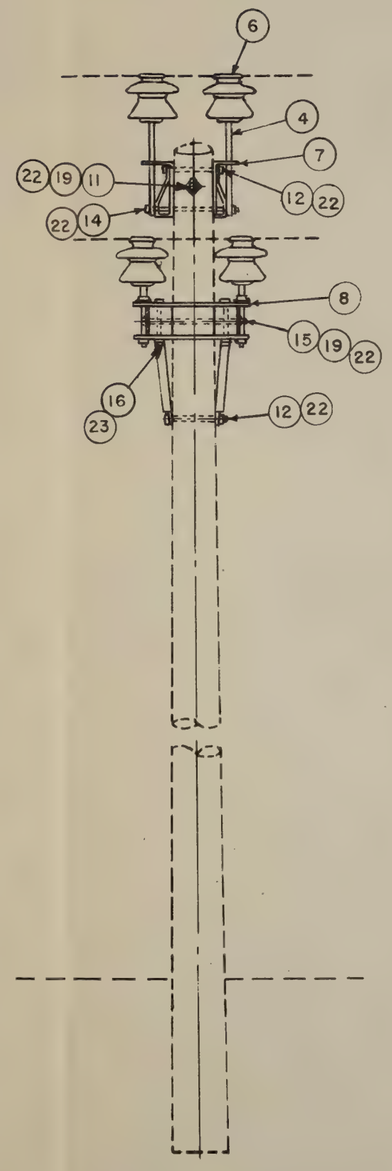
The Construction Drawings and Plans for this Project are as follows:

CONSTRUCTION DRAWINGS:

PLANS:



TYPE TP-1
SINGLE ARM



TYPE TP-2
DOUBLE ARM

* Strike out item which does not apply.

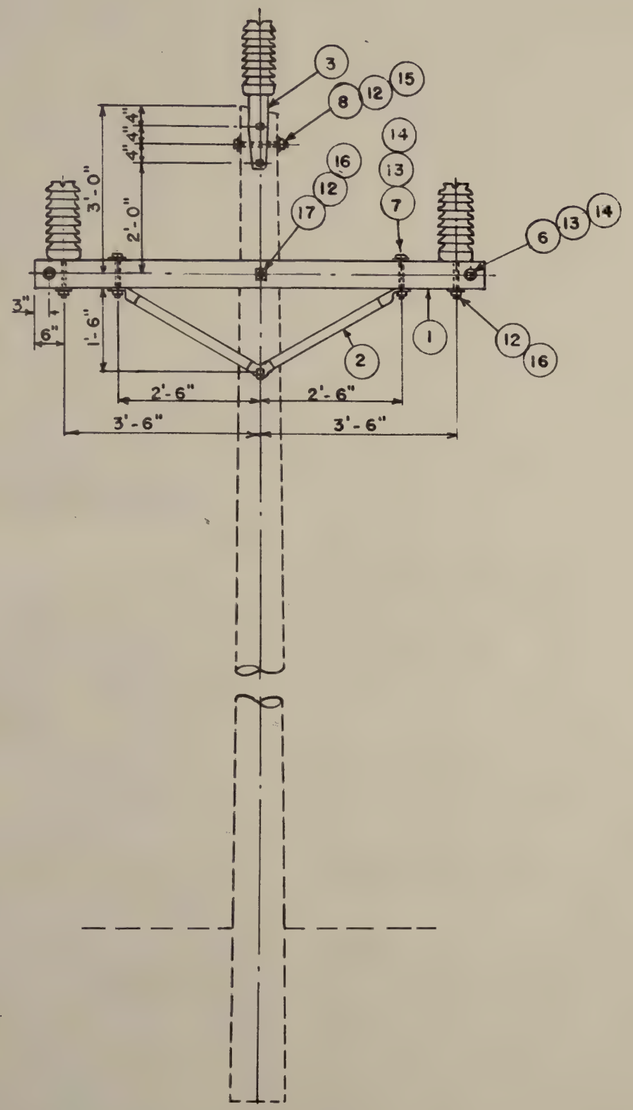
LIST OF MATERIAL

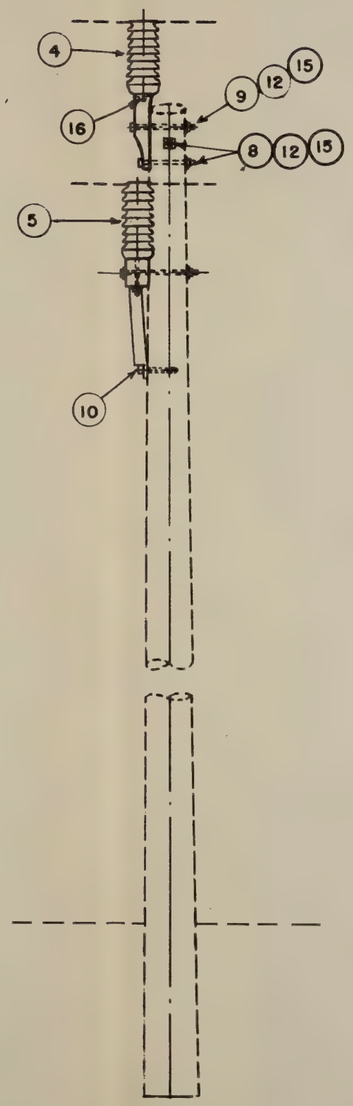
DRG. REF.	REQ'D P-1	REQ'D P-2	DESCRIPTION	ITEM
1	1	2	4"x5"x 8'-0" Wood Crossarm	g
2	1	2	60" Wood Crossarm Brace	cu
3	2	4	10" Insulator Pin, Lead Thread	f
4	1	2	Pole Top Pin	b
5	1		5/8"x 12" Special Eye Bolt for Pole Top Pin	dx
6	3	6	Pin Type Insulator	a
7		2	Pole Top Bracket	cs
8		4	Double Arming Plate	ct
9	2	4	1/2"x 6" Machine Bolt	c
10	2	4	1/2"x 7" Machine Bolt	c
11	2	1	5/8"x 12" Machine Bolt	c
12		2	5/8"x 14" Machine Bolt	c
13	1		3/4"x 16" Machine Bolt	c
14		1	5/8"x 18" Machine Bolt	c
15		1	3/4"x 20" Machine Bolt	c
16		4	3/4"x 8" Machine Bolt	c
* 17	1		5/8"x 5" Lag Screw or 5/8"x12" Mach. Bolt & Locknut	j
18				
19	8	4	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
20	6	12	1 3/8" Galv. Round Washer, 9/16" Hole	d
21	4	8	Locknuts for 1/2" Bolt	ek
22	3	4	Locknuts for 5/8" Bolt	ek
23	3	9	Locknuts for 3/4" Bolt	ek

TRANSMISSION LINE TANGENT STRUCTURES
_____KV. PIN TYPE
(46 KV. MAXIMUM)

Scale: 3/8"=1'-0"		Date:
		TP-1, TP-2

946698 O—51 (Fold-in No. 1)





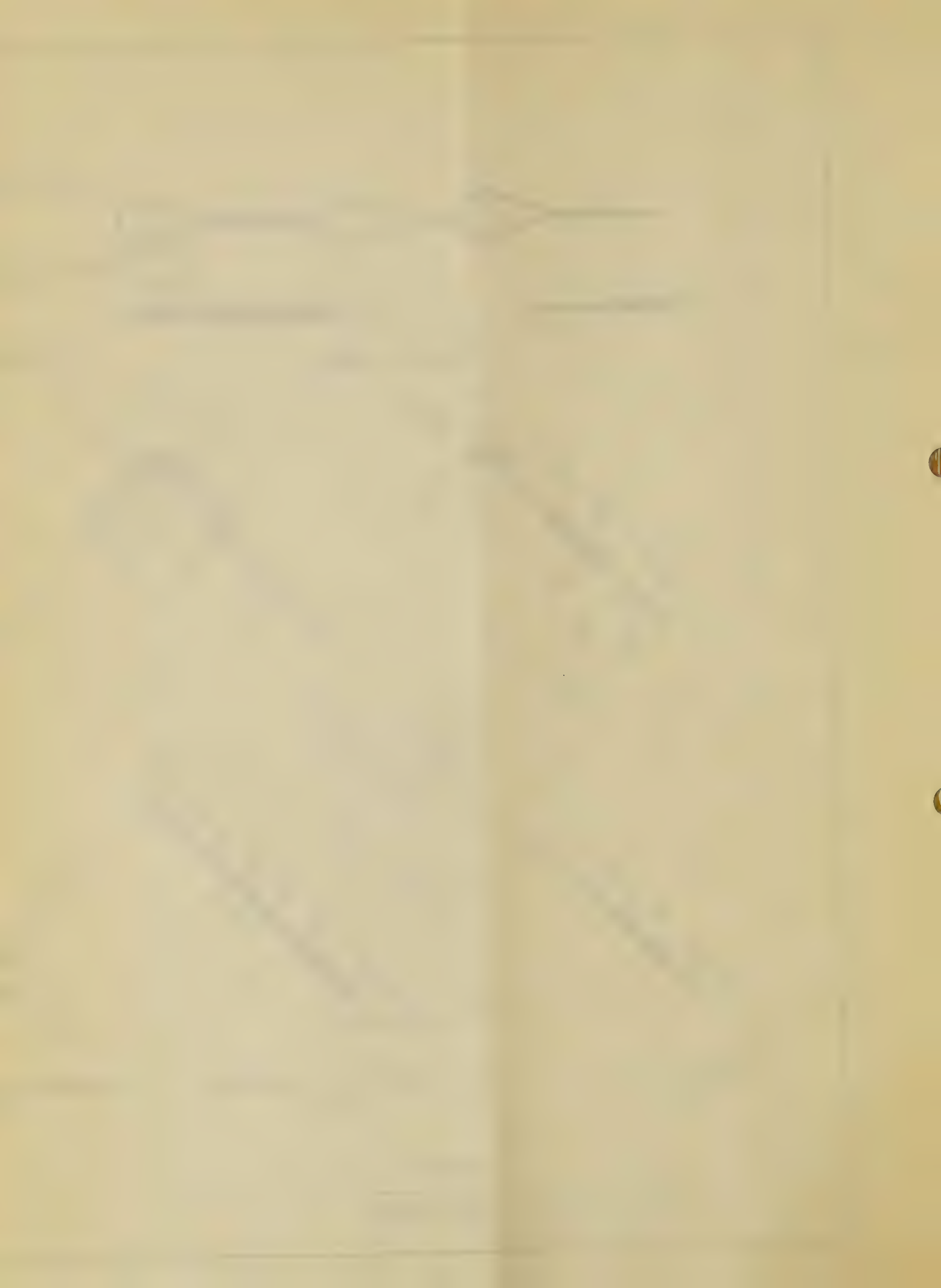
LIST OF MATERIAL			
DRG. REF.	REQ'D	DESCRIPTION	ITEM
1	1	4"x5"x 8'-0" Wood Crossarm	g
2	1	60" Wood Crossarm Brace	cu
3	1	Pole Top Fitting for Post Insulator	eb
4	1	Post Type Insulator, Short Stud	ea
5	2	Post Type Insulator, Long Stud	ea
6	2	1/2"x 6" Machine Bolt	c
7	2	1/2"x 7" Machine Bolt	c
8	2	5/8"x 12" Machine Bolt	c
9	1	5/8"x 16" Machine Bolt	c
* 10	1	5/8"x 5" Lag Screw or 5/8"x12" Mach.Bolt & Locknut	j
11			
12	8	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
13	6	1 3/8" Galv. Round Washer, 9/16" Hole	d
14	4	Locknuts for 1/2" Bolt	ek
15	3	Locknuts for 5/8" Bolt	ek
16	4	Locknuts for 3/4" Bolt	ek
17	1	3/4"x 16" Machine Bolt	c

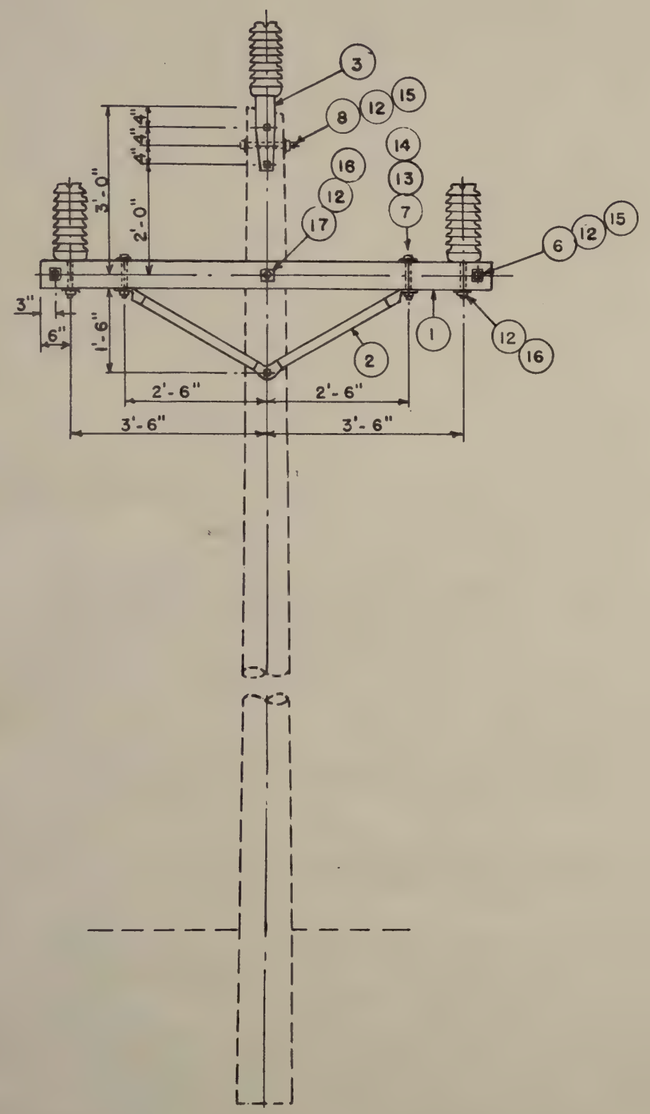
*Strike out item which does not apply.

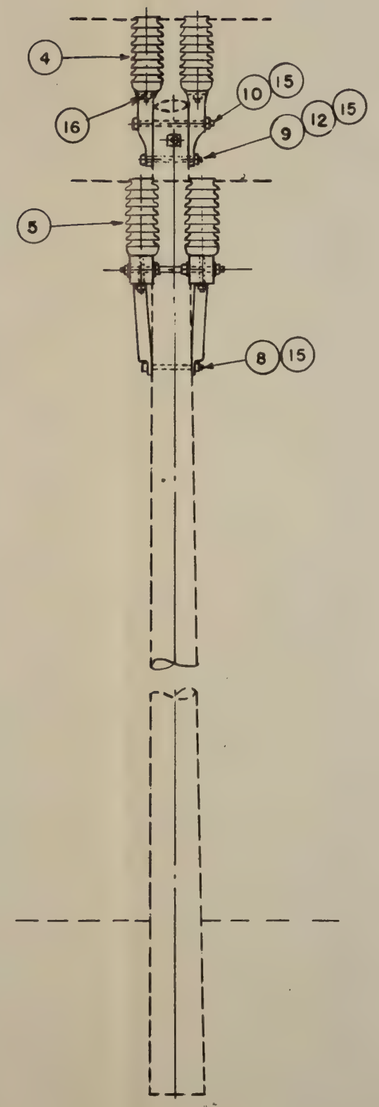
TRANSMISSION LINE TANGENT STRUCTURE
_____ KV. POST TYPE
(46 KV. MAXIMUM)

Scale: 3/8"=1'-0"		Date:
		TP-3

946698 O—51 (Fold-in No. 2)







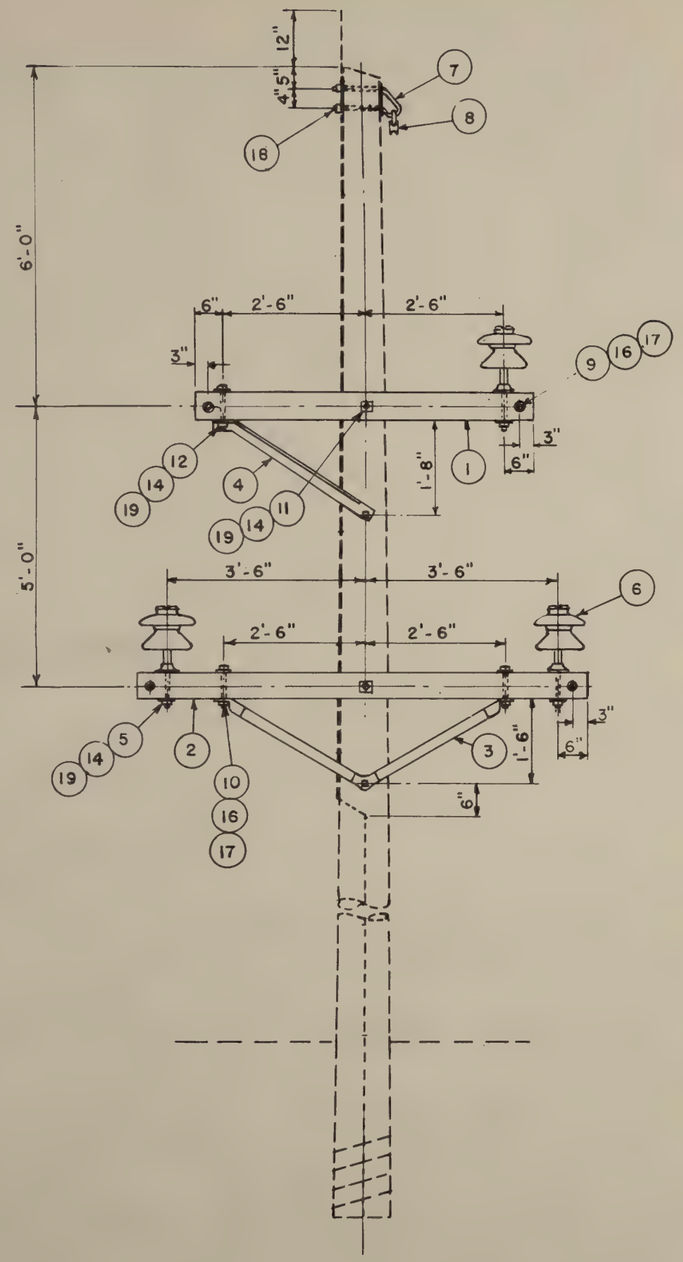
LIST OF MATERIAL

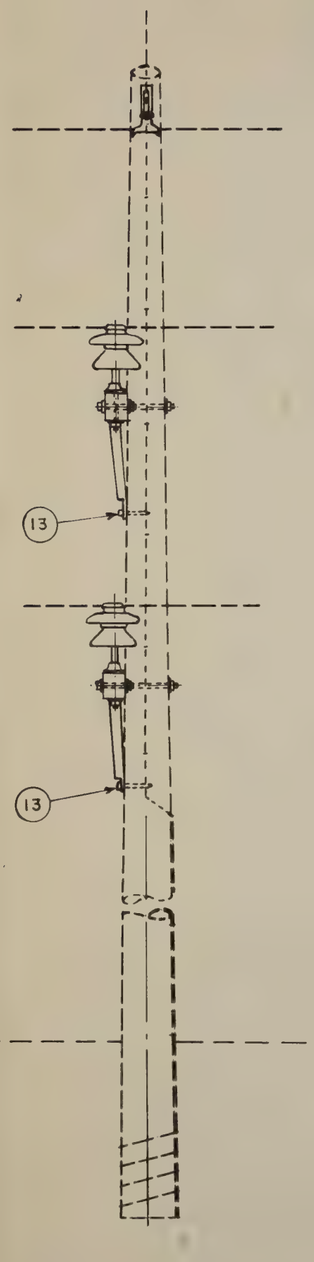
DRG. REF.	REQ'D	DESCRIPTION	ITEM
1	2	4"x5"x8'-0" Wood Crossarm	g
2	2	60" Wood Crossarm Brace	cu
3	2	Pole Top Fitting for Post Insulator	eb
4	2	Post Type Insulator, Short Stud	ea
5	4	Post Type Insulator, Long Stud	ea
6	2	5/8"x 22" Double Arming Bolt	n
7	4	1/2"x 7" Machine Bolt	c
8	2	5/8"x12" Machine Bolt	c
9	1	5/8"x14" Machine Bolt	c
10	1	5/8"x 20" Machine Bolt	c
11			
12	16	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
13	4	1 3/8" Galv. Round Washer, 9/16" Hole	d
14	4	Locknuts for 1/2" Bolt	ek
15	8	Locknuts for 5/8" Bolt	ek
16	7	Locknuts for 3/4" Bolt	ek
17	1	3/4"x20" Machine Bolt	c

TRANSMISSION LINE TANGENT STRUCTURE
KV. POST TYPE
(46 KV. MAXIMUM)

Scale: 3/8"=1'-0"		Date:
		TP-4

946698 O—51 (Fold-in No. 3)





NOTE:

Make one turn of downlead underneath washer around overhead ground wire support bolts and staple to pole so that it does not come in contact with crossarms or through bolts.

* Strike out item which does not apply.

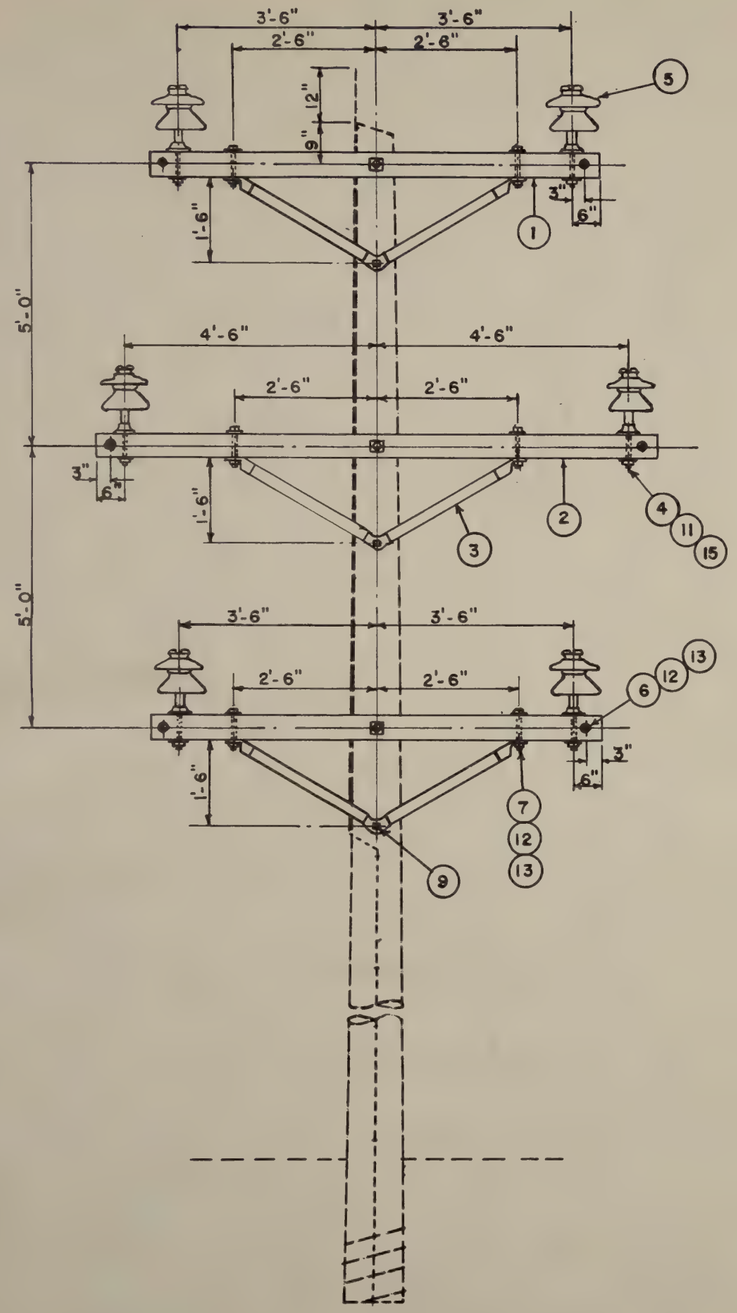
LIST OF MATERIAL

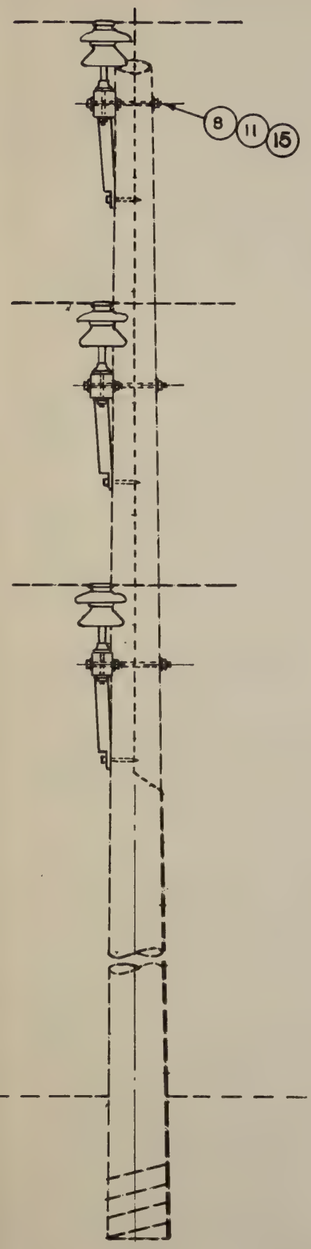
DRG. REF.	REQ'D	DESCRIPTION	ITEM
1	1	4"x 5"x 6'-0" Wood Crossarm	g
2	1	4"x 5"x 8'-0" Wood Crossarm	g
3	1	60" Wood Crossarm Brace	cu
4	1	36" Alley Arm Brace	em
5	3	10" Insulator Pin, Lead Thread	f
6	3	Pin Type Insulator	a
7	1	Ground Wire Cable Support	ed
8	1	Ground Wire Suspension Clamp	m
9	4	1/2"x 6" Machine Bolt	c
10	2	1/2"x 7" Machine Bolt	c
11	2	3/4"x 18" Machine Bolt	c
12	1	3/4"x 8" Machine Bolt	c
* 13	2	5/8"x 5" Lag Screw or 5/8"x12" Mach. Bolt & Locknut	j
14	8	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
15			
16	10	1 3/8" Galv. Round Washer, 9/16" Hole	d
17	6	Locknuts for 1/2" Bolt	ek
18	2	Locknuts for 5/8" Bolt	ek
19	6	Locknuts for 3/4" Bolt	ek

TRANSSMISSION LINE TANGENT STRUCTURE
_____KV. PIN TYPE WITH OVERHEAD GROUND
(46 KV. MAXIMUM)

Scale: 3/8"=1'-0"		Date:
		TP-5

946698 O—51 (Fold-in No. 4)





NOTE:
Staple downlead to pole so that it does not come in contact with crossarms or through bolts.

* Strike out items which do not apply.

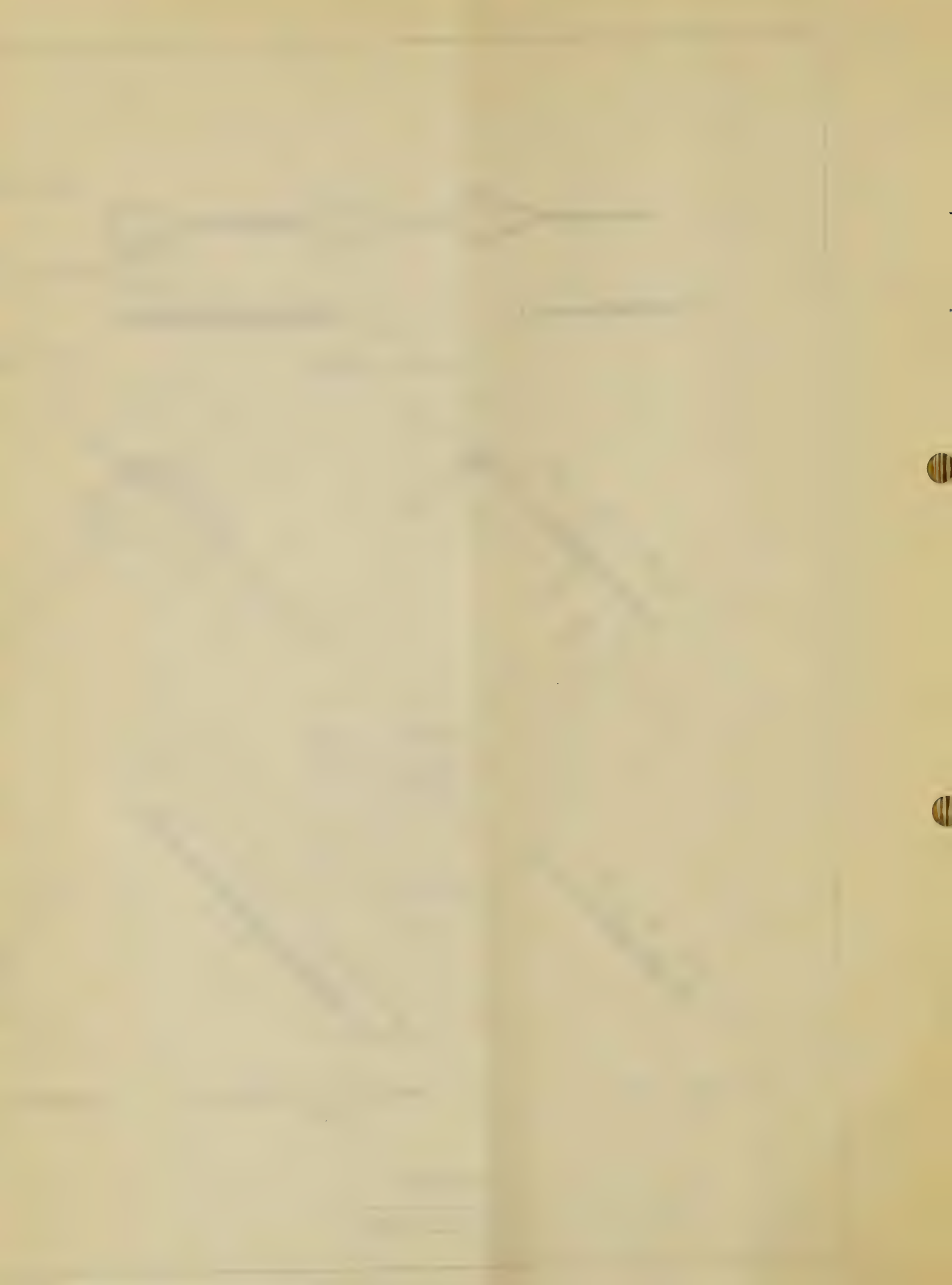
LIST OF MATERIAL

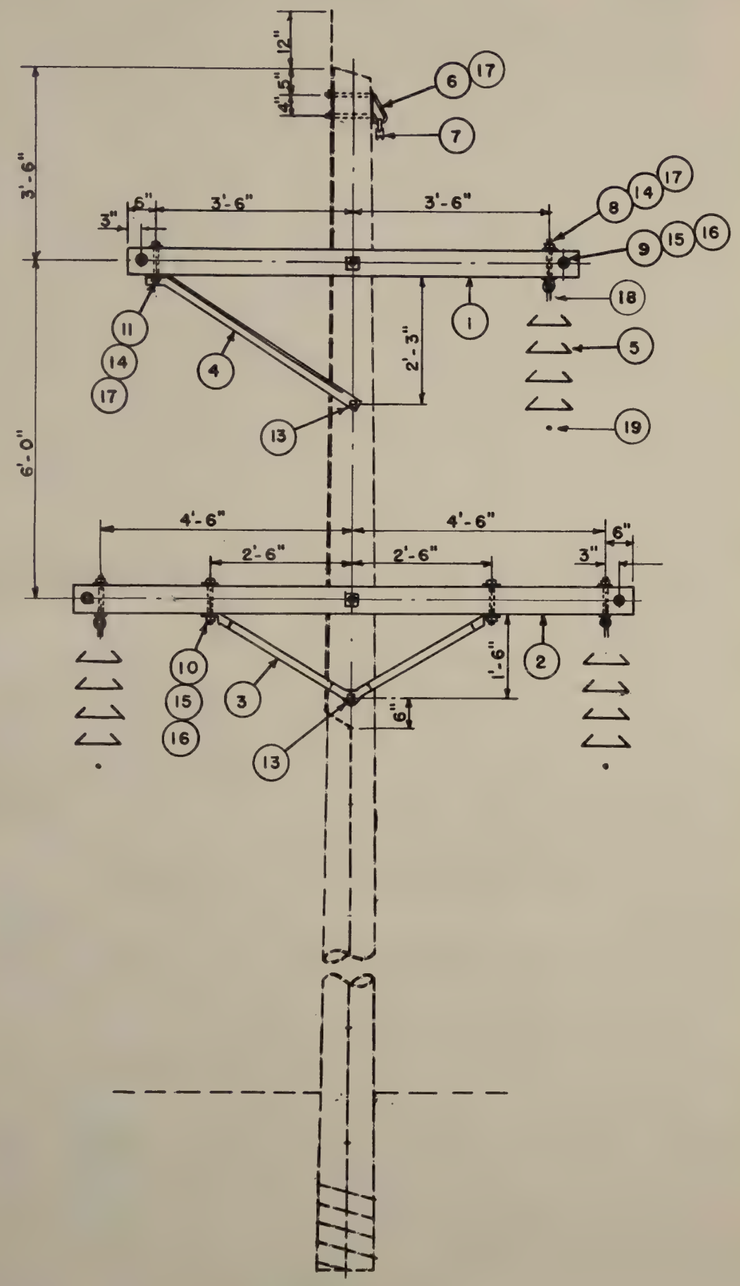
DRG. REF.	REQ'D	DESCRIPTION	ITEM
1	2	4"x 5"x 8'-0" Wood Crossarm	g
2	1	4"x 5"x 10'-0" Wood Crossarm	g
3	3	60" Wood Crossarm Brace	cu
4	6	10" Insulator Pin, Lead Thread	f
5	6	Pin Type Insulator	a
6	6	1/2"x 6" Machine Bolt	c
7	6	1/2"x 7" Machine Bolt	c
8	3	3/4"x 18" Machine Bolt	c
* 9	3	5/8"x 5" Lag Screw or 5/8"x 12" Mach. Bolt & Locknut	j
10			
11	12	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
12	18	1 3/8" Galv. Round Washer, 9/16" Hole	d
13	12	Locknuts for 1/2" Bolt	ek
14			
15	9	Locknuts for 3/4" Bolt	ek

TRANSMISSION LINE TANGENT STRUCTURE
____ KV PIN TYPE - DOUBLE CIRCUIT
(46 KV. MAXIMUM)

Scale: 3/8"=1'-0"		Date:
		TP-6

946698 O—51 (Fold-in No. 5)





* As required. See Drg. TM-1

** Strike out item which does not apply.

NOTE:

Make one turn of downlead underneath washer around overhead ground wire support bolts and staple to pole so that it does not come in contact with crossarms or through bolts.

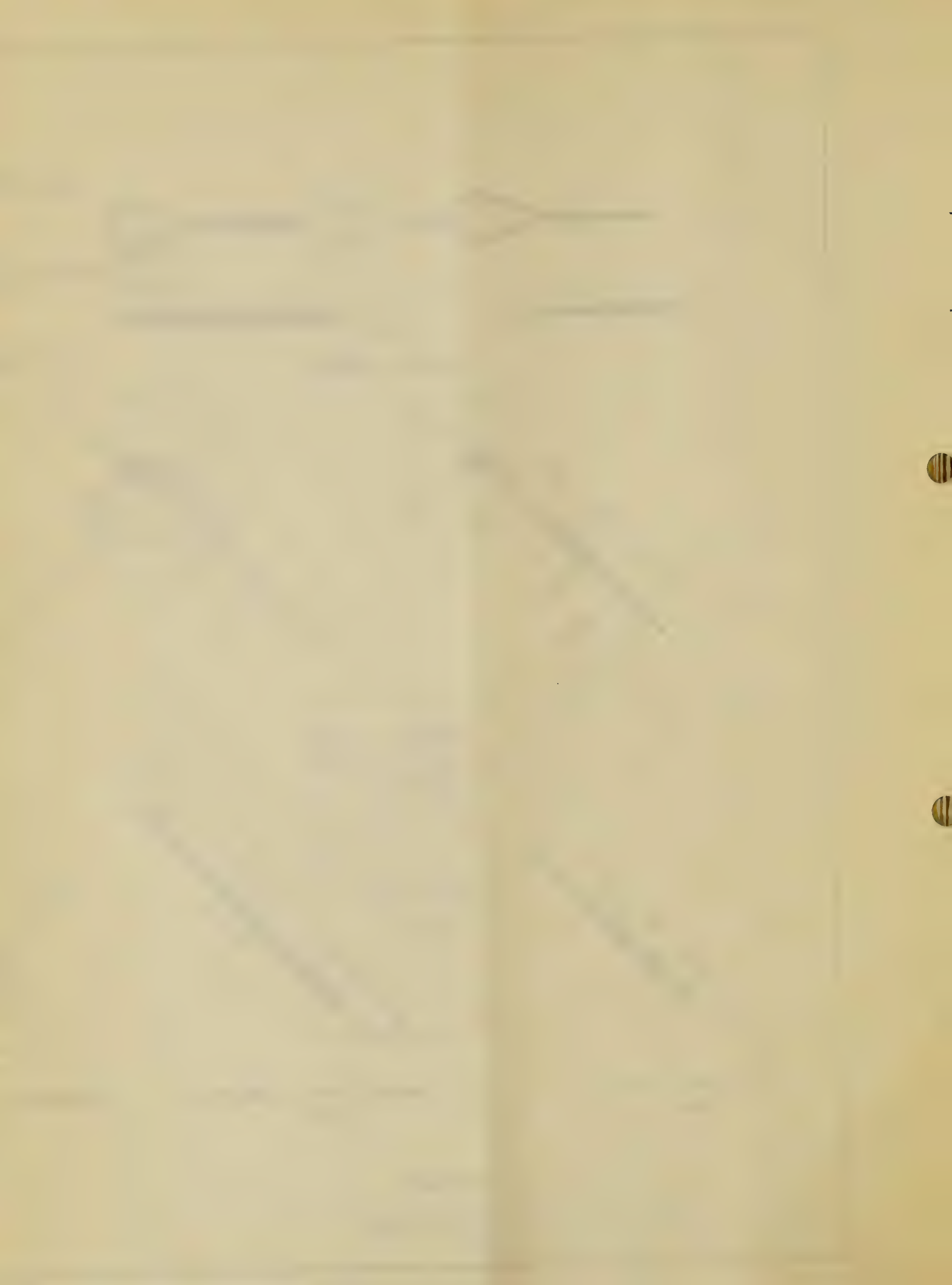
LIST OF MATERIAL

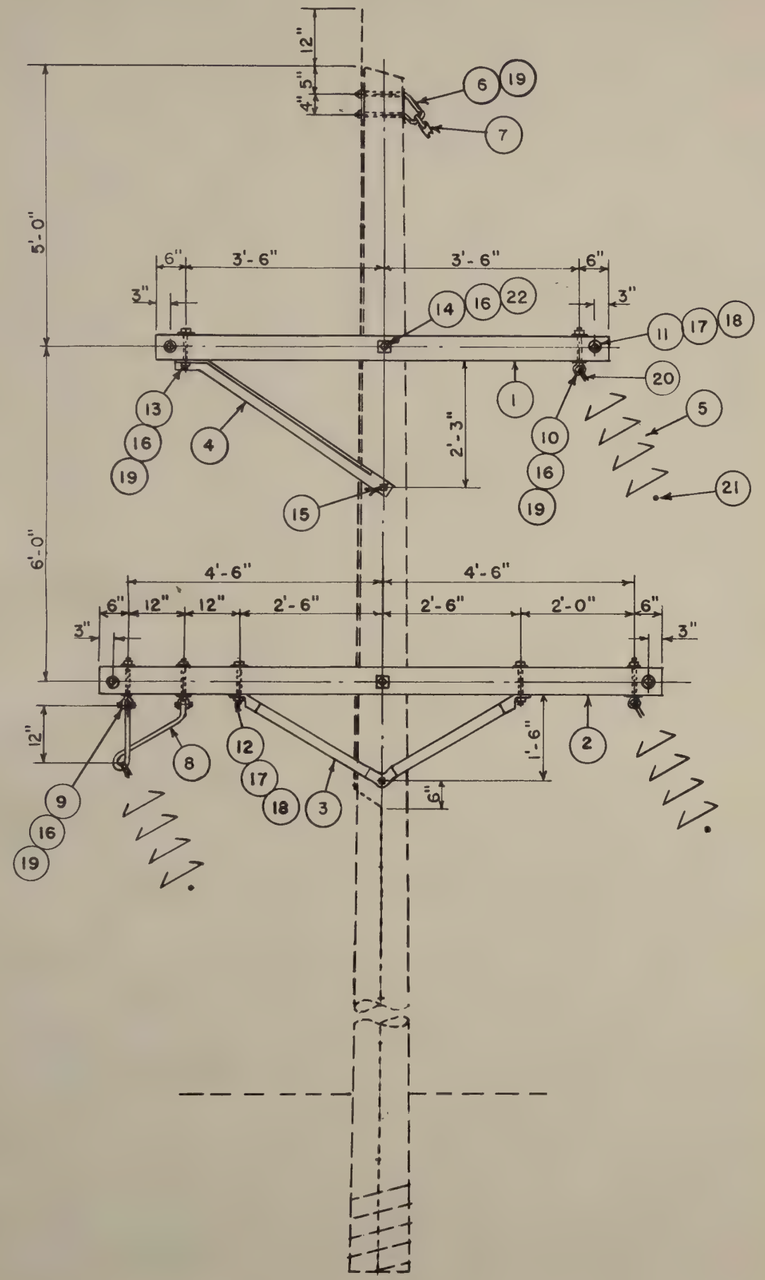
	DRG. REF.	REQ'D	DESCRIPTION	ITEM
	1	1	4 3/4"x5 3/4"x8'-0" Wood Crossarm	g
	2	1	4 3/4"x5 3/4"x10'-0" Wood Crossarm	g
	3	1	60" Wood Crossarm Brace	cu
	4	1	48" Alley Arm Brace	em
	5	*	5 3/4"x10" Suspension Insulator	k
	6	1	Ground Wire Cable Support	ed
	7	1	Ground Wire Suspension Clamp	m
	8	3	5/8"x8" Eye Bolt	o
	9	4	1/2"x7" Machine Bolt	c
	10	2	1/2"x8" Machine Bolt	c
	11	1	5/8"x8" Machine Bolt	c
	12	2	3/4"x18" Machine Bolt	c
**	13	2	5/8"x5" Lag Screw or 5/8"x12" Mach. Bolt & Locknut	j
	14	11	2 1/4"x2 1/4"x3/16" Galv. Sq. Washer, 13/16" Hole	d
	15	10	1 3/8" Galv. Round Washer, 9/16" Hole	d
	16	6	Locknuts for 1/2" Bolt	ek
	17	6	Locknuts for 5/8" Bolt	ek
	18	3	Suspension Hook	eh
	19	3	Suspension Clamp and Connecting Piece	ei
	20	2	Locknuts for 3/4" Bolts	ek

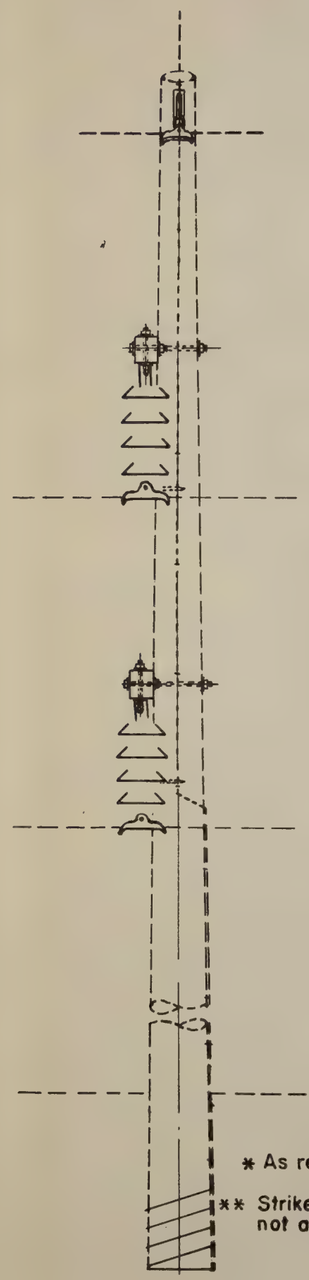
TRANSMISSION LINE TANGENT STRUCTURE
____ KV. SINGLE POLE SUSPENSION
(69 KV. MAXIMUM)

Scale: 3/8"=1'-0"		Date:
		TS-1

946698 O—51 (Fold-in No. 6)







* As required. See Drg.TM-1

** Strike out item which does not apply.

NOTE:

Make one turn of downlead underneath washer around overhead ground wire support bolts, and staple to pole so that it does not come in contact with crossarms or through bolts.

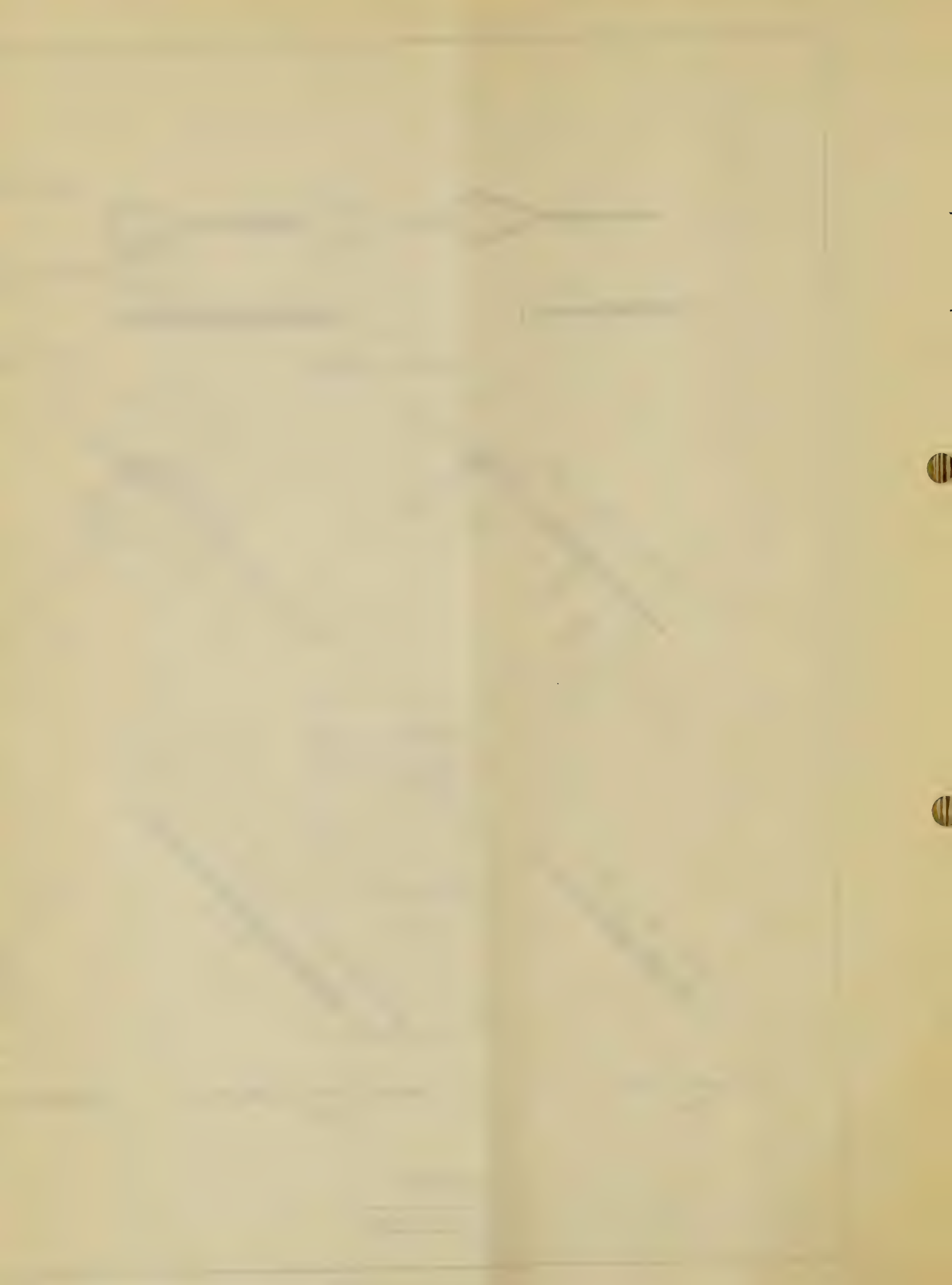
LIST OF MATERIAL

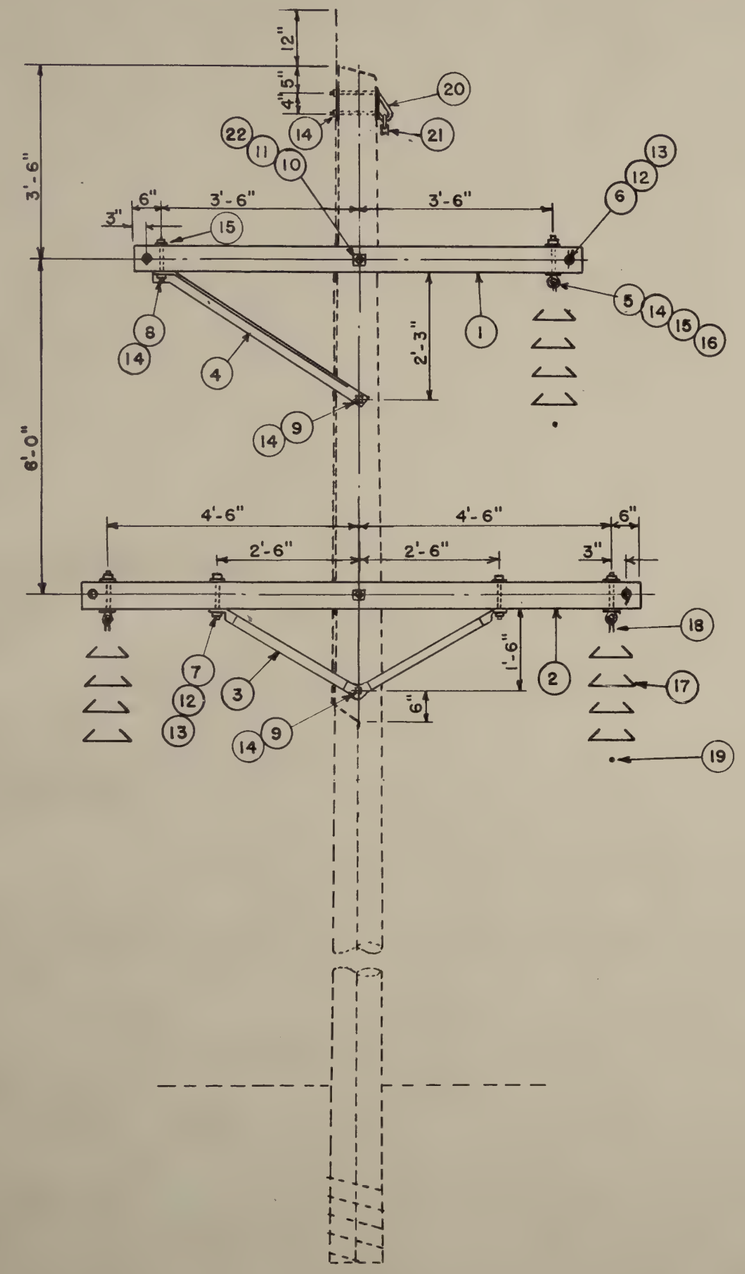
DRG. REF.	REQ'D	DESCRIPTION	ITEM
1	1	4 3/4"x 5 3/4"x 8'-0" Wood Crossarm	g
2	1	4 3/4"x5 3/4"x10'-0" Wood Crossarm	g
3	1	60" Wood Crossarm Brace	cu
4	1	48" Alley Arm Brace	em
5	*	5 3/4"x 10" Suspension Insulator	k
6	1	Ground Wire Cable Support	ed
7	1	Ground Wire Suspension Clamp	m
8	1	3/4" Angle Bracket	cr
9	2	5/8"x 8" Clevis Bolt	ef
10	2	5/8"x 8" Eye Bolt	o
11	4	1/2"x 7" Machine Bolt	c
12	2	1/2"x 8" Machine Bolt	c
13	1	5/8"x 8" Machine Bolt	c
14	2	3/4"x18" Machine Bolt	c
** 15	2	5/8"x 5" Lag Screw or 5/8"x12" Mach. Bolt & Locknut	j
16	13	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
17	10	1 3/8" Galv. Round Washer, 9/16" Hole	d
18	6	Locknuts for 1/2" Bolts	ek
19	7	Locknuts for 5/8" Bolts	ek
20	3	Suspension Hook	eh
21	3	Suspension Clamp and Connecting Piece	ei
22	2	Locknuts for 3/4" Bolts	ek

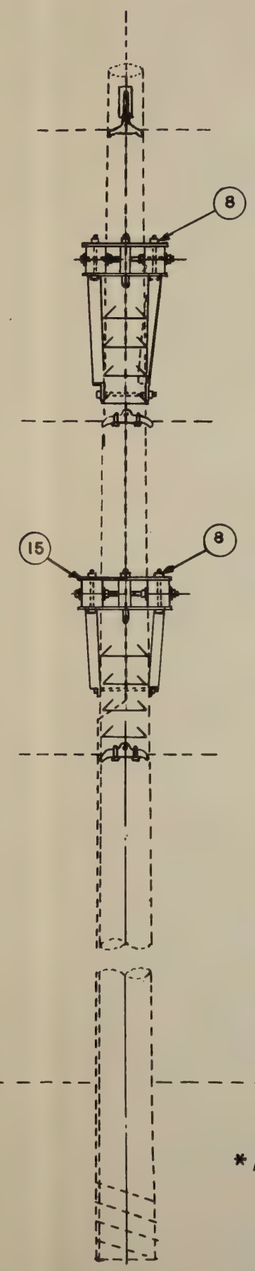
TRANSMISSION LINE SMALL ANGLE STRUCTURE
____ KV. SINGLE POLE SUSPENSION
(69 KV. MAXIMUM)

Scale: 3/8"=1'-0"		Date:
		TS-1B

946698 O—51 (Fold-in No. 7)




12"
4'-5"
3'-6"
20
22
11
14
21
10
13
12
6
3"
6"
3'-6"
3'-6"
15
5
14
15
16
8
14
4
2'-3"
1
14
9
4'-6"
4'-6"
6"
2'-6"
2'-6"
3"
18
7
12
13
3
14
9
1'-6"
6"
2
17
19



* As required. See Drg. TM-1

NOTE

Make one turn of downlead underneath washer around overhead ground wire support bolts, and staple to pole so that it does not come in contact with crossarms or through bolts.

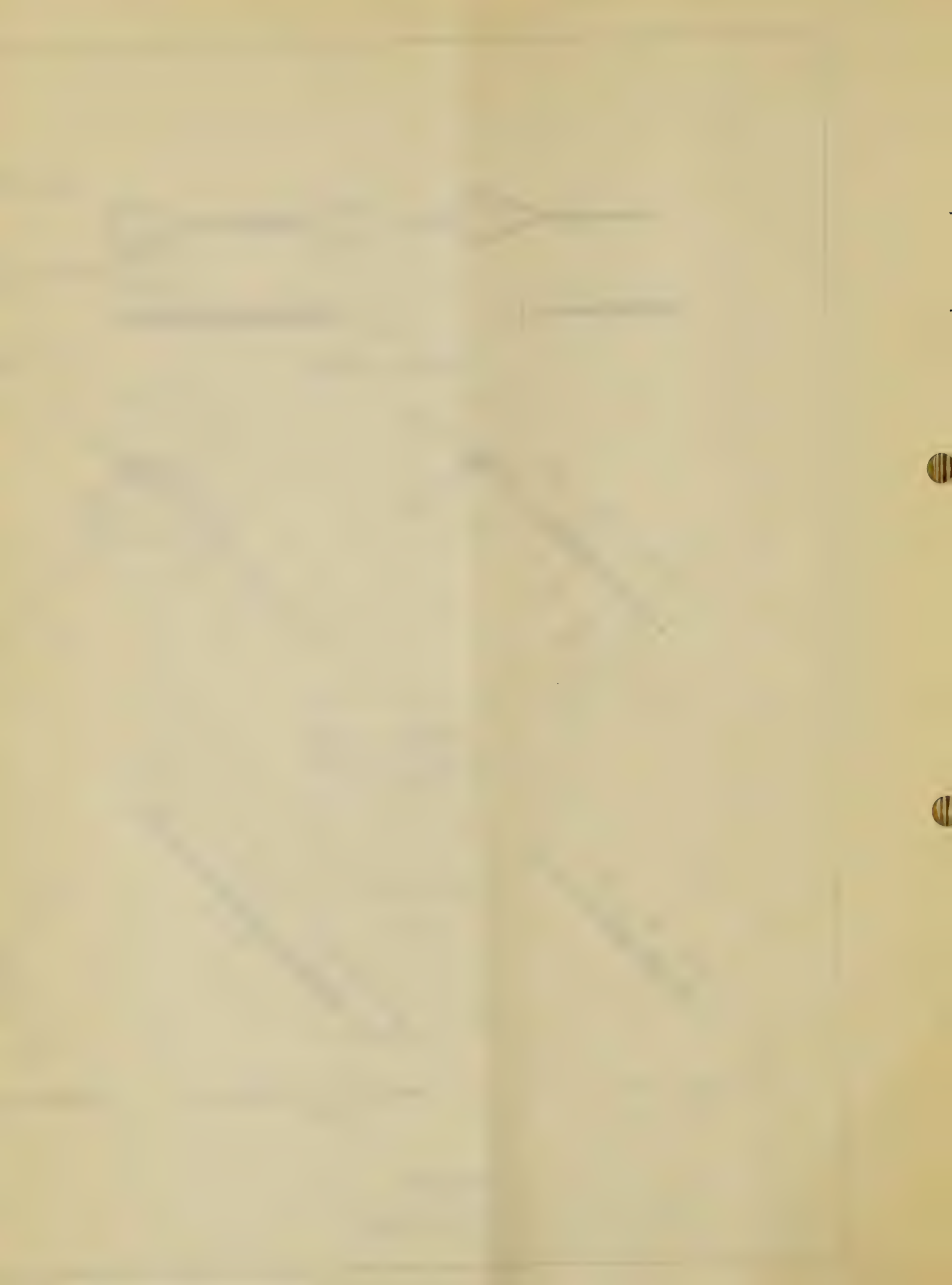
LIST OF MATERIAL

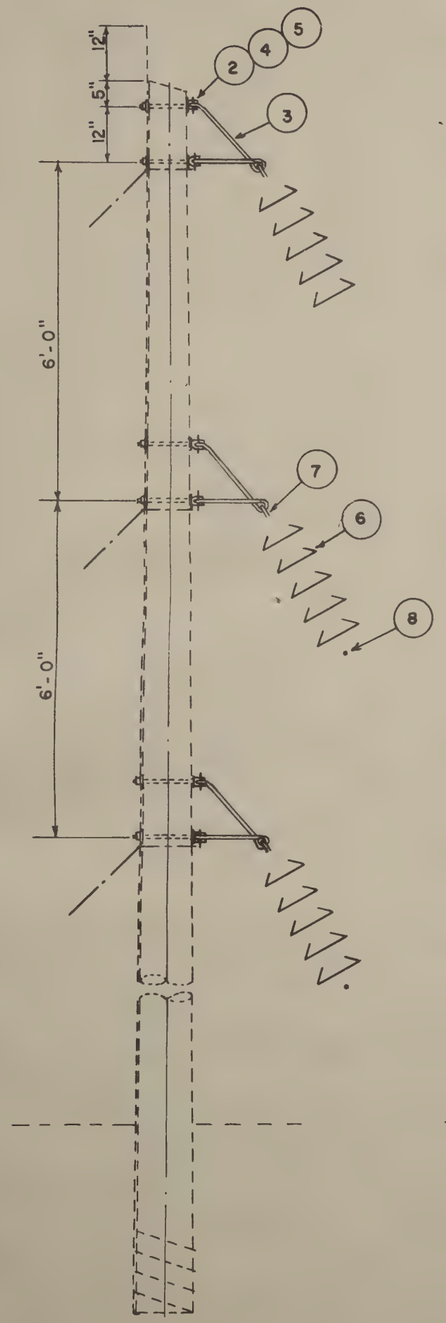
DR'G REF.	REQ'D	DESCRIPTION	ITEM
1	2	4 3/4"x 5 3/4"x 8'-0" Wood Crossarm	g
2	2	4 3/4"x 5 3/4"x10'-0" Wood Crossarm	g
3	2	60" Wood Crossarm Brace	cu
4	2	48" Alley Arm Brace	em
5	3	5/8"x 8" Eye Bolt	o
6	8	1/2"x 6" Machine Bolt	c
7	4	1/2"x 8" Machine Bolt	c
8	8	5/8"x8" Machine Bolt	c
9	2	5/8"x 12" Machine Bolt	c
10	2	3/4"x24"Machine Bolt	c
11	4	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
12	20	1 3/8" Galv. Round Washer, 9/16" Hole	d
13	12	Locknuts for 1/2" Bolt	ek
14	13	Locknuts for 5/8" Bolt	ek
15	7	1/4"x 4"x17" Double Arming Plate	ct
16	3	3/4"x 5 3/4" Pipe Spacer	
17	*	5 3/4"x 10" Suspension Insulator	k
18	3	Suspension Hook	eh
19	3	Suspension Clamp and Connecting Piece	ei
20	1	Overhead Ground Wire Cable Support	ed
21	1	Ground Wire Suspension Clamp	m
22	2	Locknuts for 3/4" Bolt	ek

TRANSSMISSION LINE TANGENT STRUCTURE
___ KV. SINGLE POLE SUSPENSION - DOUBLE ARM
(69 KV. MAXIMUM)

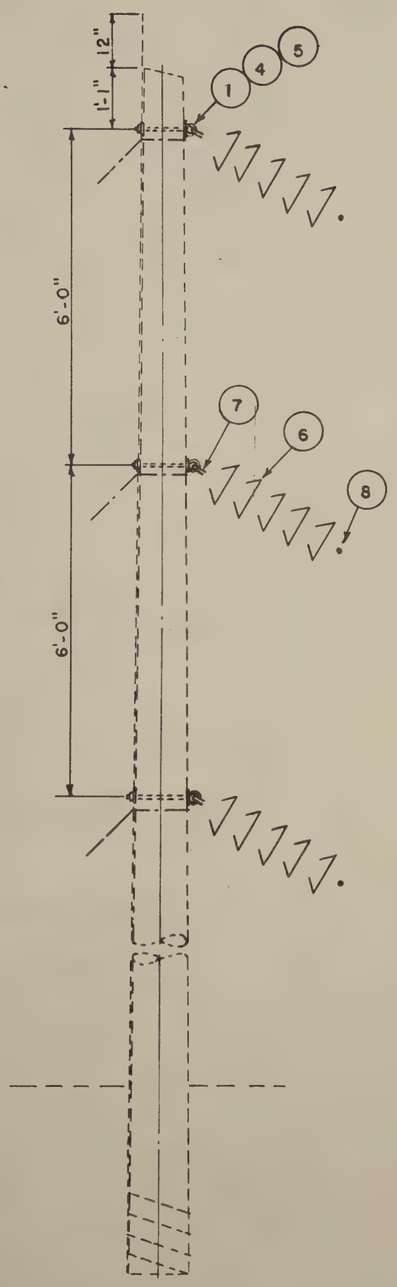
Scale: 3/8"=1'-0"		Date:
		TS-2

946698 O—51 (Fold-in No. 8)

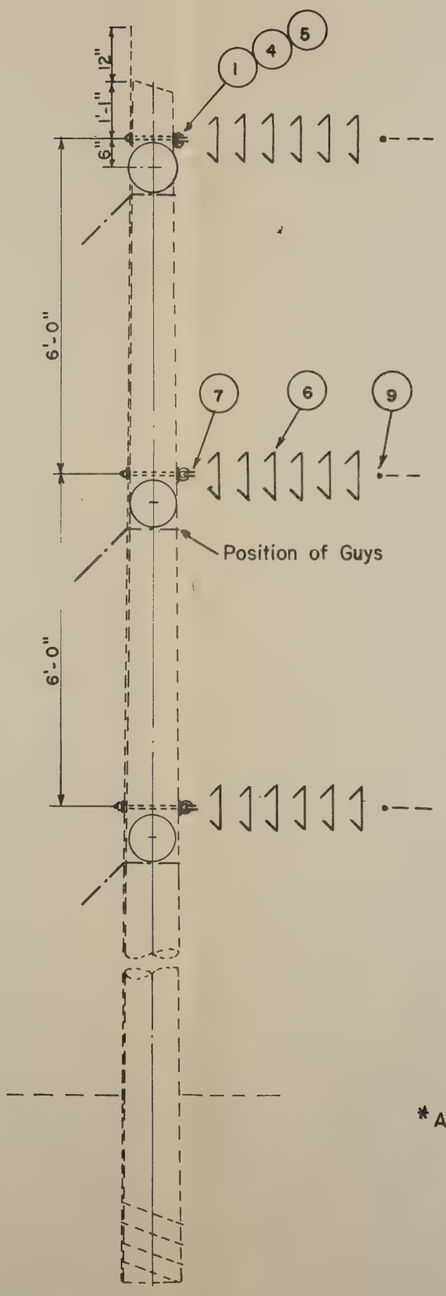




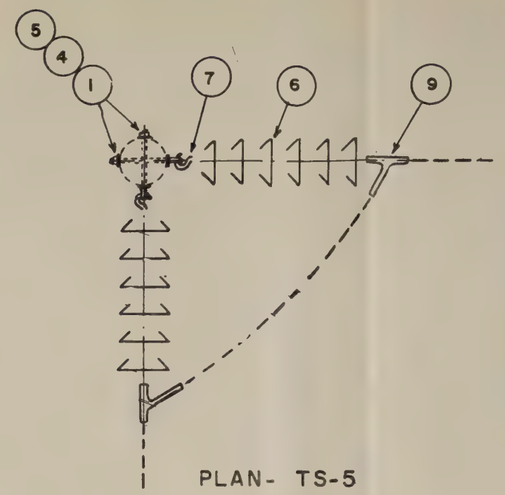
TS-3
MEDIUM ANGLE



TS-4
LARGE ANGLE



TS-5
50°-90° DEAD END



PLAN- TS-5

NOTE.
Make one turn of downlead underneath washers around conductor support bolts.

LIST OF MATERIAL

DR'G REF.	REQUIRED TS-3	TS-4	TS-5	DESCRIPTION	ITEM
1		3	6	3/4"x 14" Eye Bolt	o
2	6			3/4"x 14" Clevis Bolt	ef
3	3			3/4" Angle Bracket	cr
4	12	6	12	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
5	6	3	6	Locknuts for 3/4" Bolt	ek
6	*	*	*	5 3/4"x 10" Suspension Insulator	k
7	3	3	6	Suspension Hook	eh
8	3	3		Suspension Clamp and Connecting Piece	ei
9			6	Dead End Clamp and Connecting Piece	ej

*As required, see Drg. TM-1

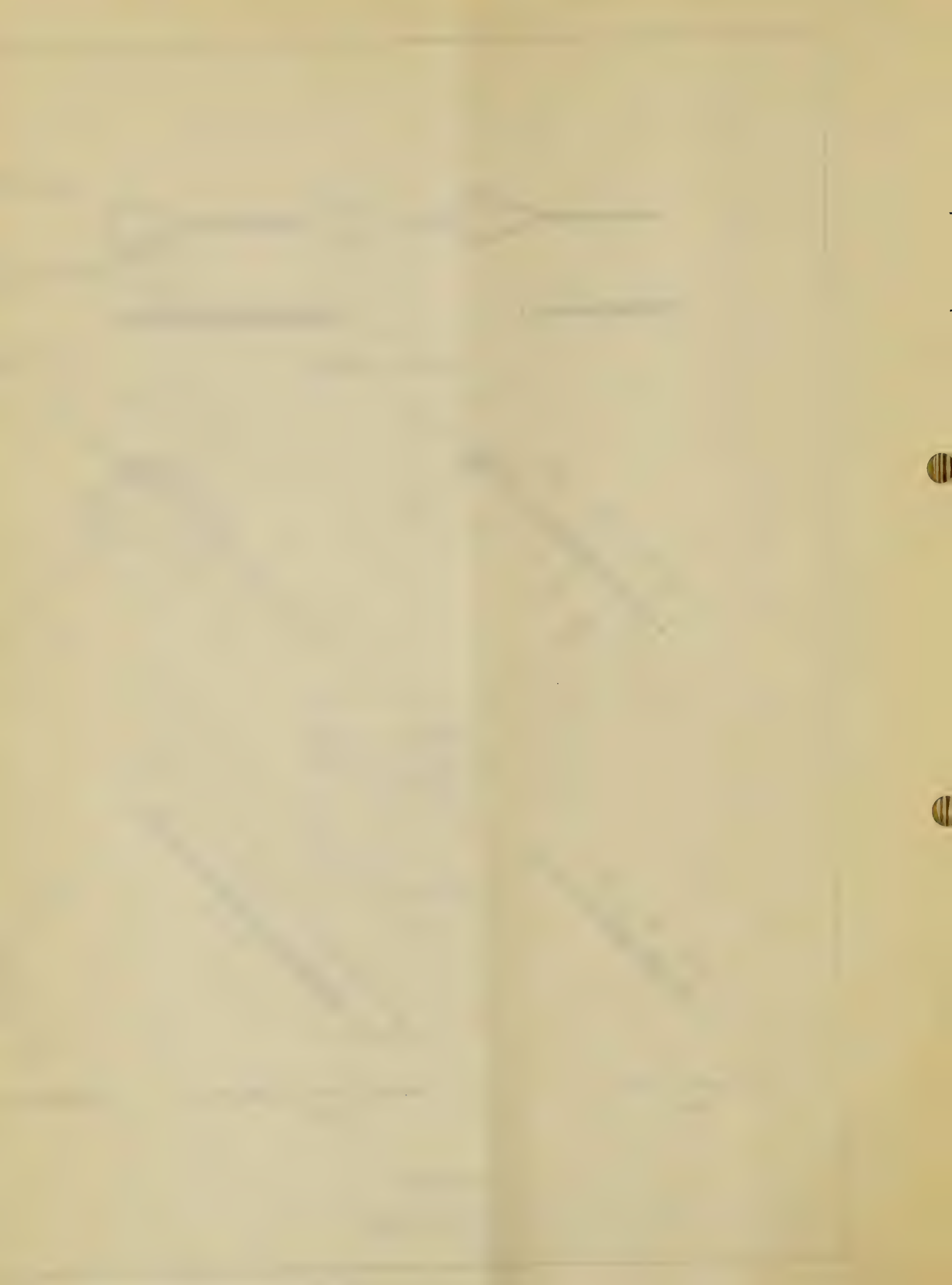
TRANSMISSION LINE VERTICAL STRUCTURES
_____ KV. SINGLE POLE SUSPENSION
(69 KV. MAXIMUM)

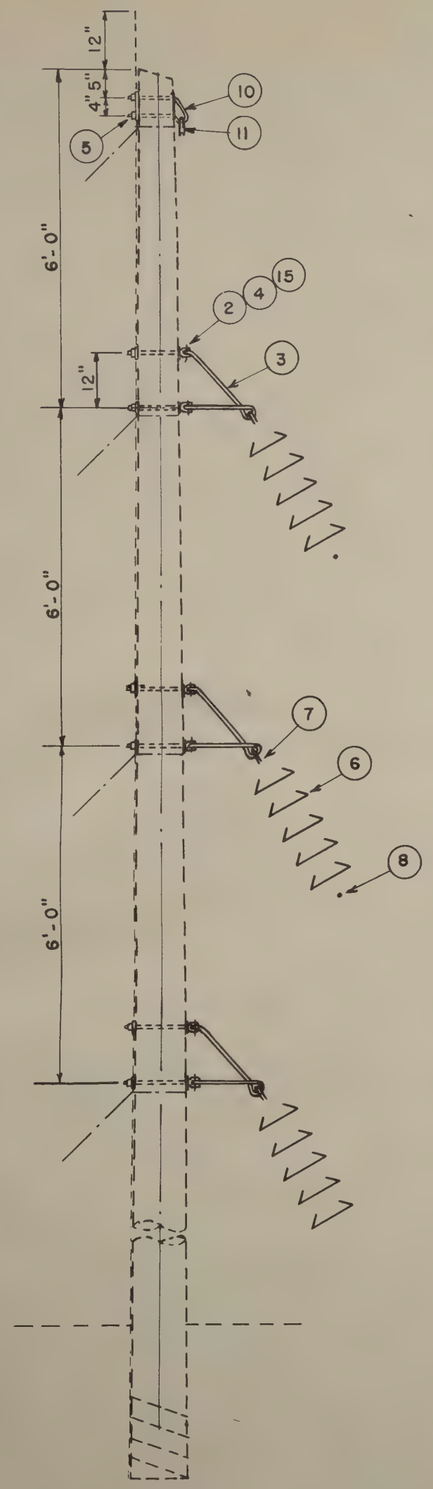
Scale: 3/8"=1'-0"

Date:

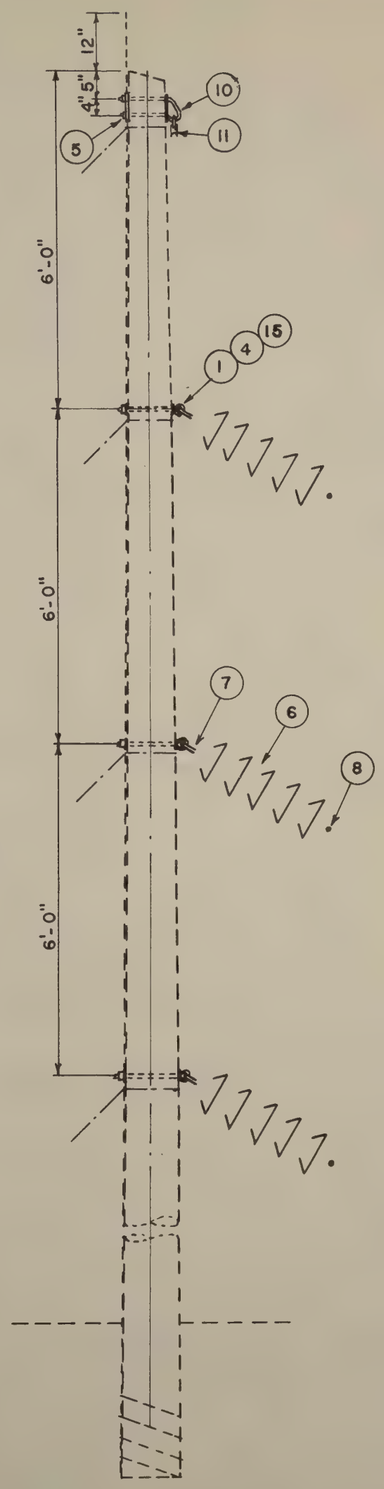
TS-3,4,5

946698 O—51 (Fold-in No. 9

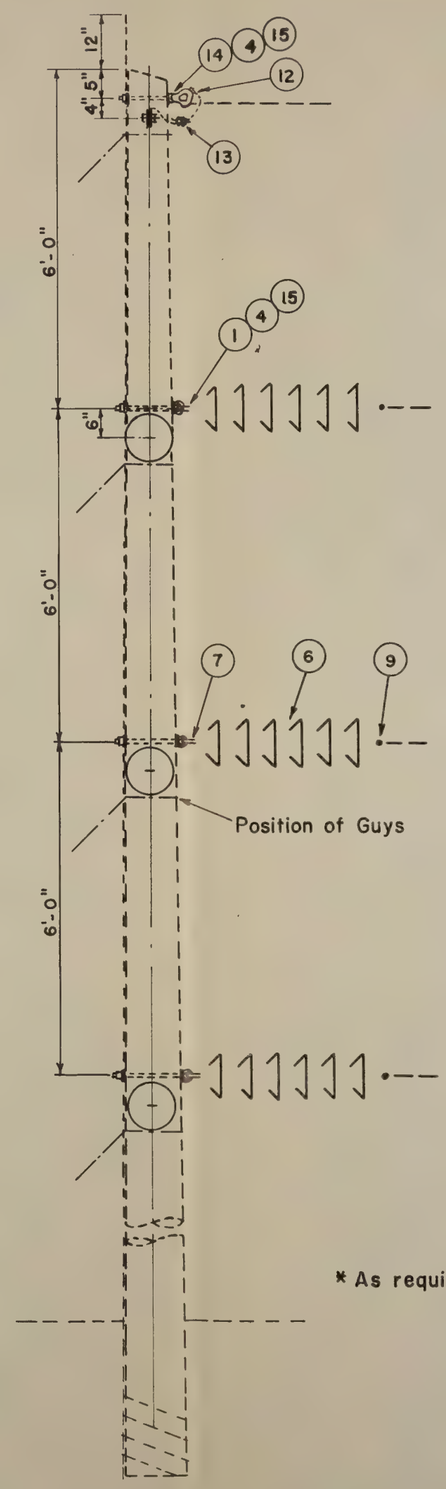




TS-3G
MEDIUM ANGLE

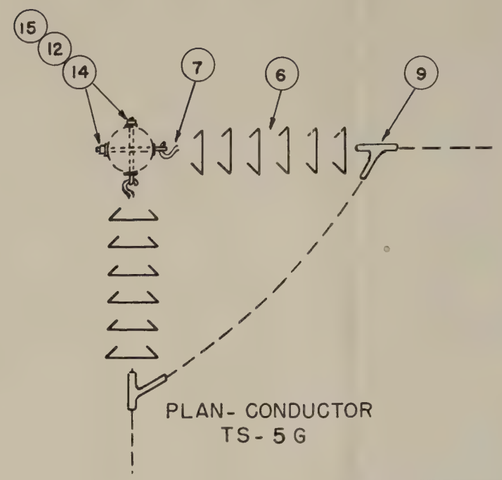


TS-4G
LARGE ANGLE

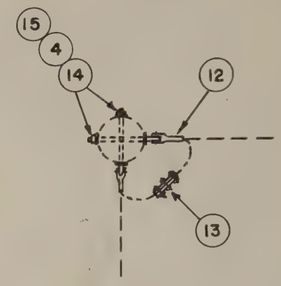


TS-5G
50°-90° DEAD END

NOTE:
Make one turn of downlead underneath washers around conductor support bolts and overhead ground wire support bolts.



PLAN- CONDUCTOR
TS-5G



PLAN- GROUND WIRE
TS-5G

LIST OF MATERIAL

DR'G. REF.	REQUIRED TS-3G	TS-4G	TS-5G	DESCRIPTION	ITEM
1		3	6	3/4"x14" Eye Bolt	o
2	6			3/4"x14" Clevis Bolt	ef
3	3			3/4" Angle Bracket	cr
4	12	6	16	2 1/4"x2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
5	2	2		Locknuts for 5/8" Bolt	ek
6	*	*	*	5 3/4"x10" Suspension Insulator	k
7	3	3	6	Suspension Hook	eh
8	3	3		Suspension Clamp and Connecting Piece	ei
9			6	Dead End Clamp and Connecting Piece	ej
10	1	1		Ground Wire Cable Support	ed
11	1	1		Ground Wire Suspension Clamp	m
12			2	Ground Wire Dead End Clamp	l
13			1	6"- 3 Bolt Clamp	u
14			2	3/4"x12" Eye Bolt	o
15	6	3	8	Locknuts for 3/4" Bolt	ek

* As required. See Drg. TM-1

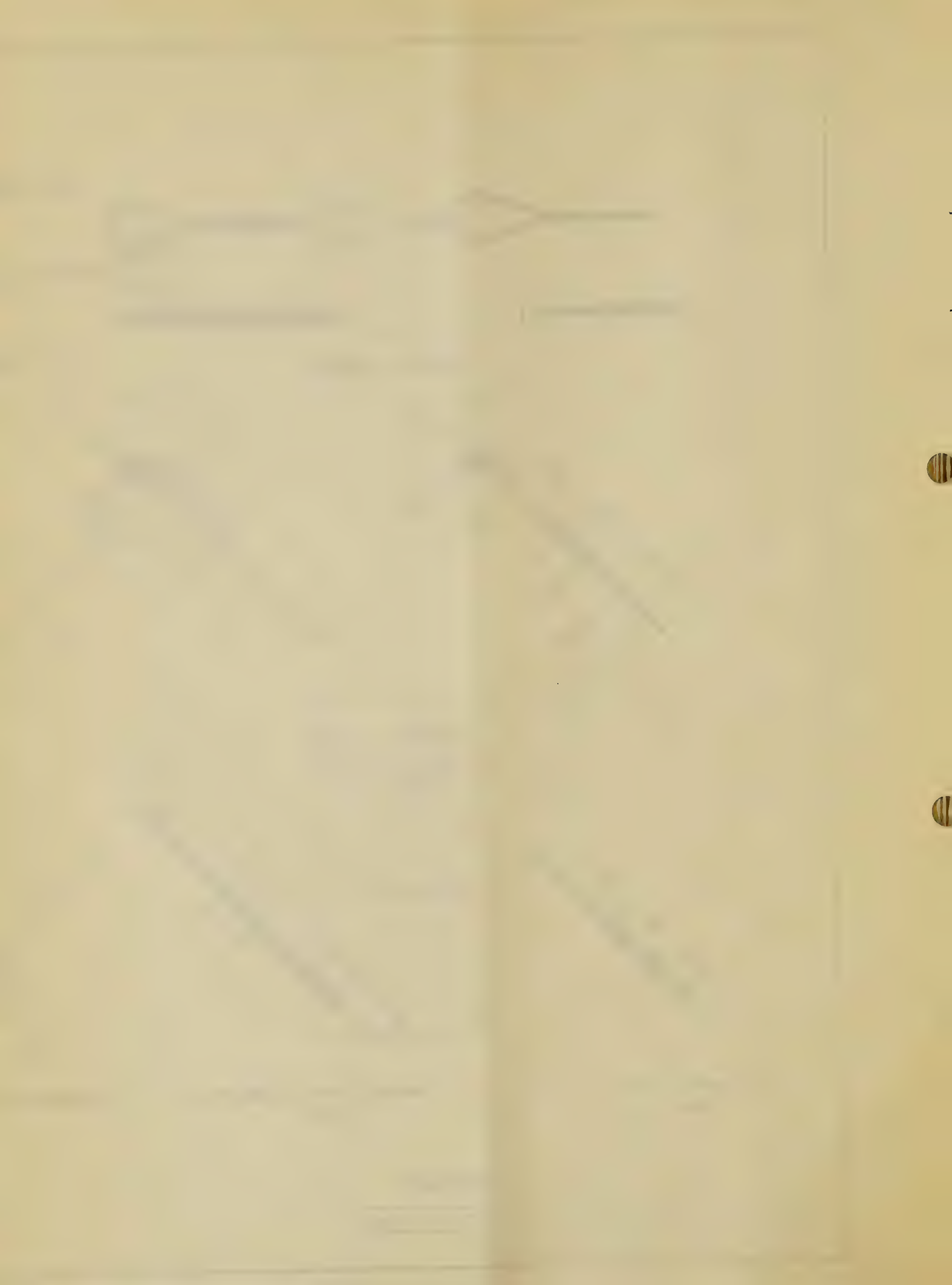
TRANSMISSION LINE VERTICAL STRUCTURES

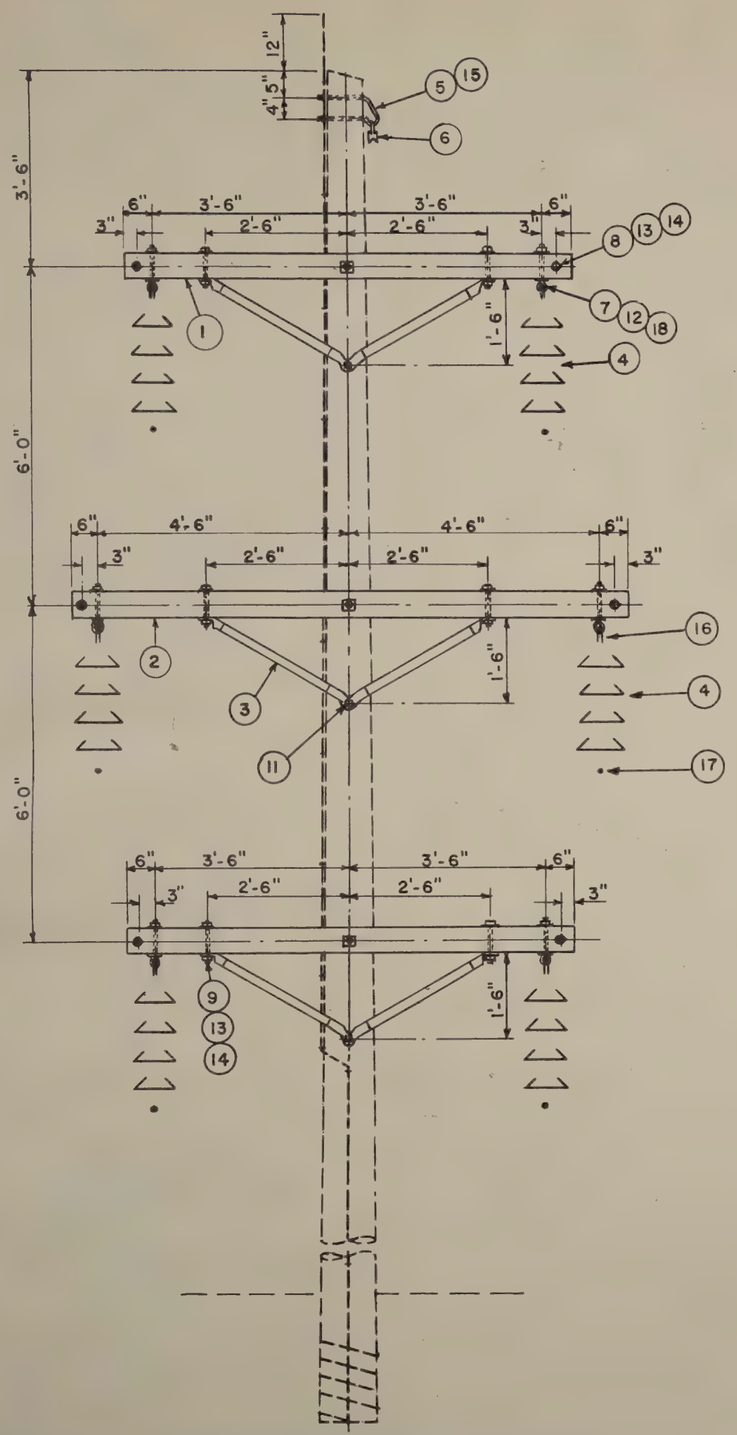
___KV. SINGLE POLE SUSPENSION-WITH OVERHEAD GR'D

(69 KV. MAXIMUM)

Scale: 3/8"=1'-0"		Date:
		TS-3G,4G,5G

946698 O—51 (Fold-in No. 10)





NOTE:
Make one turn of downlead underneath washer ground overhead ground wire support bolts, and staple to pole so that it does not come in contact with crossarms or through bolts.

* As required. See Drg. TM-1

** Strike out item which does not apply.

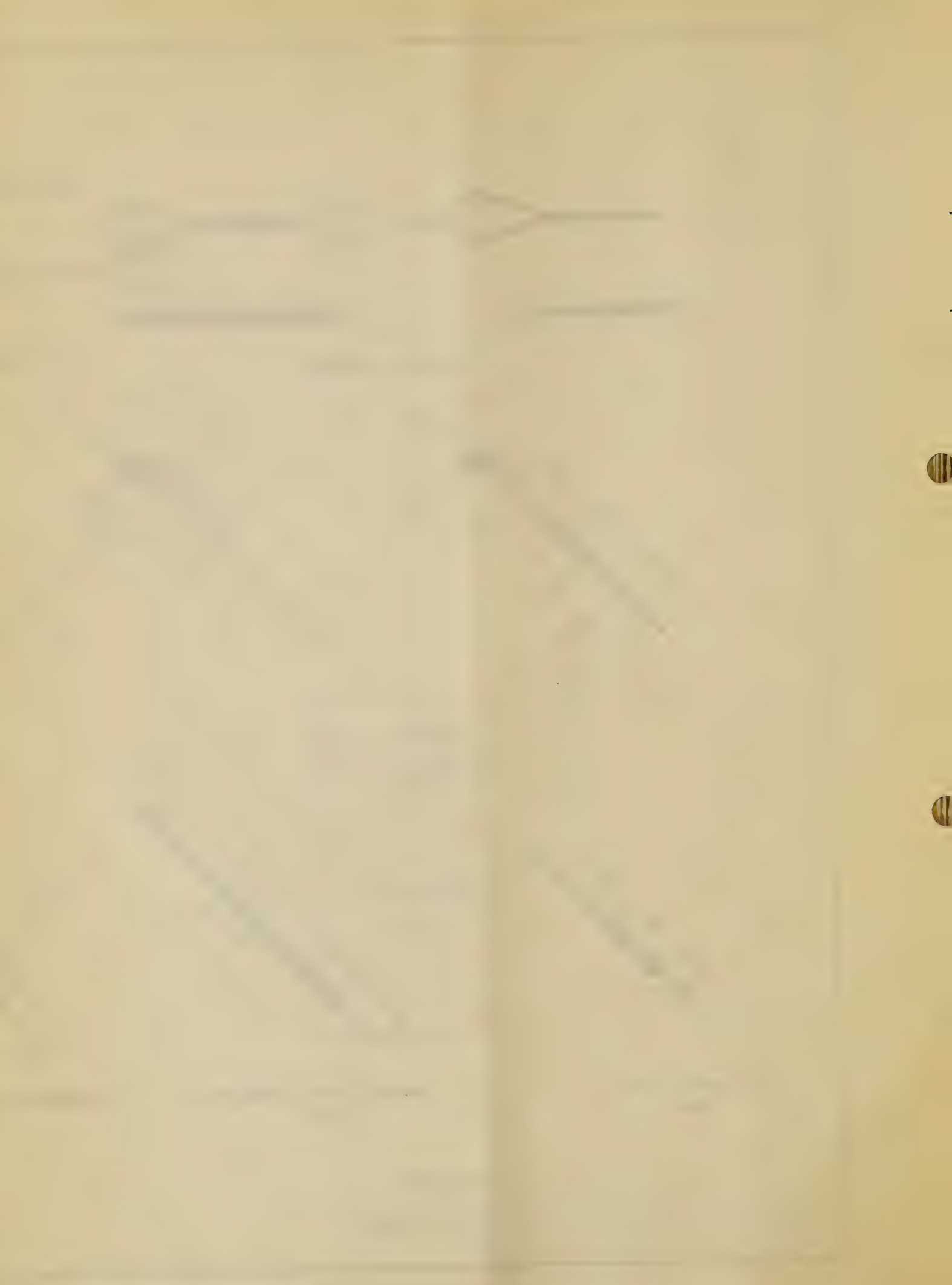
LIST OF MATERIAL

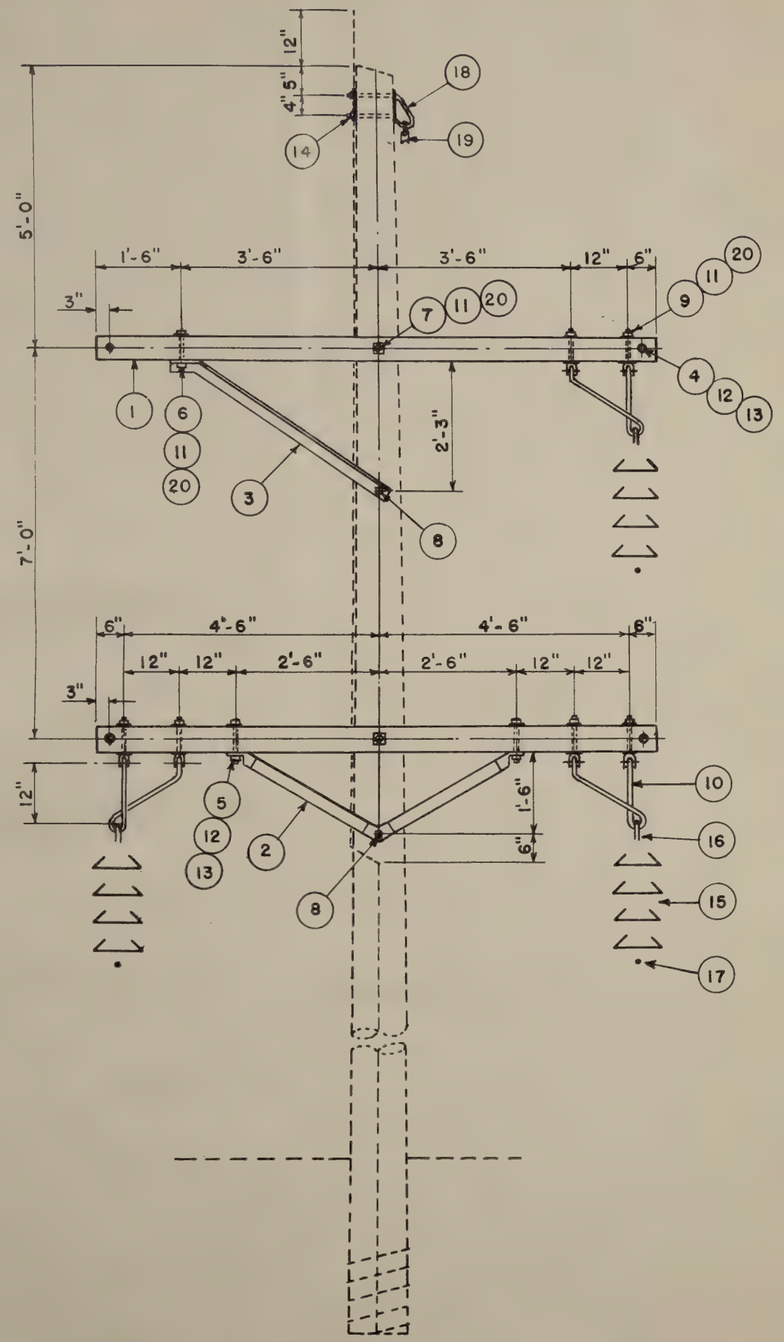
DR'G. REF.	REQ'D	DESCRIPTION	ITEM
1	2	4 3/4"x 5 3/4"x 8'-0" Wood Crossarm	g
2	1	4 3/4"x5 3/4"x10'-0" Wood Crossarm	g
3	3	60" Wood Crossarm Brace	cu
4	*	5 3/4"x 10" Suspension Insulator	k
5	1	Ground Wire Cable Support	ed
6	1	Ground Wire Suspension Clamp	m
7	6	3/4"x 8" Eye Bolt	o
8	6	1/2"x 6" Machine Bolt	c
9	6	1/2"x 8" Machine Bolt	c
10	3	3/4"x 18" Machine Bolt	c
** 11	3	5/8"x 5" Lag Screw or 5/8"x 12" Mach. Bolt & Locknut	j
12	18	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
13	18	1 3/8" Galv. Round Washer, 9/16" Hole	d
14	12	Locknuts for 1/2" Bolt	ek
15	2	Locknuts for 5/8" Bolt	ek
16	6	Suspension Hook	eh
17	6	Suspension Clamp and Connecting Piece	ei
18	9	Locknuts for 3/4" Bolt	ek

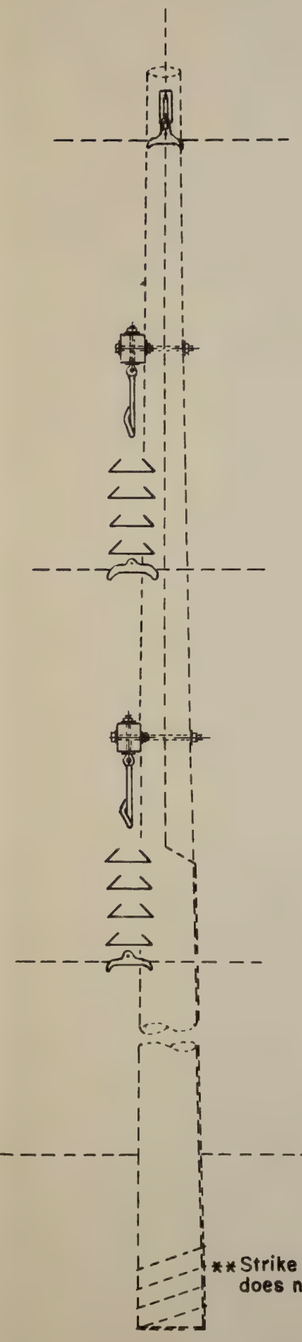
TRANSMISSION LINE TANGENT STRUCTURE
___ KV. SINGLE POLE SUSPENSION - DOUBLE CIRCUIT
(69 KV. MAXIMUM)

Scale: 3/8"=1'-0"		Date:
		TS-6

946698 O—51 (Fold-in No. 11)







* As required, see Drg. TM-1

** Strike out item which does not apply.

NOTE

Make one turn of downlead underneath washers around overhead ground wire support bolts and staple to pole so that it does not come in contact with crossarms or through bolts.

LIST OF MATERIAL

	DR'G. REF.	REQ'D	DESCRIPTION	ITEM
	1	2	4 3/4"x 5 3/4"x10'-0" Wood Crossarm	g
	2	1	60" Wood Crossarm Brace	cu
	3	1	Alley Arm Brace	em
	4	4	1/2"x 6" Machine Bolt	c
	5	2	1/2"x 8" Machine Bolt	c
	6	1	3/4"x 8" Machine Bolt	c
	7	2	3/4"x 18" Machine Bolt	c
**	8	2	5/8"x 5" Lag Screw or 5/8"x 12" Mach. Bolt & Locknut	j
	9	6	3/4"x 8" Clevis Bolt	ef
	10	3	3/4" Angle Bracket	cr
	11	17	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
	12	10	1 3/8" Galv. Round Washer, 9/16" Hole	d
	13	6	Locknuts for 1/2" Bolt	ek
	14	2	Locknuts for 5/8" Bolt	ek
	15	*	5 3/4"x 10" Suspension Insulator	k
	16	3	Suspension Hook	eh
	17	3	Suspension Clamp and Connecting Piece	ei
	18	1	Overhead Ground Wire Cable Support	ed
	19	1	Ground Wire Suspension Clamp	m
	20	9	Locknuts for 3/4" Bolt	ek

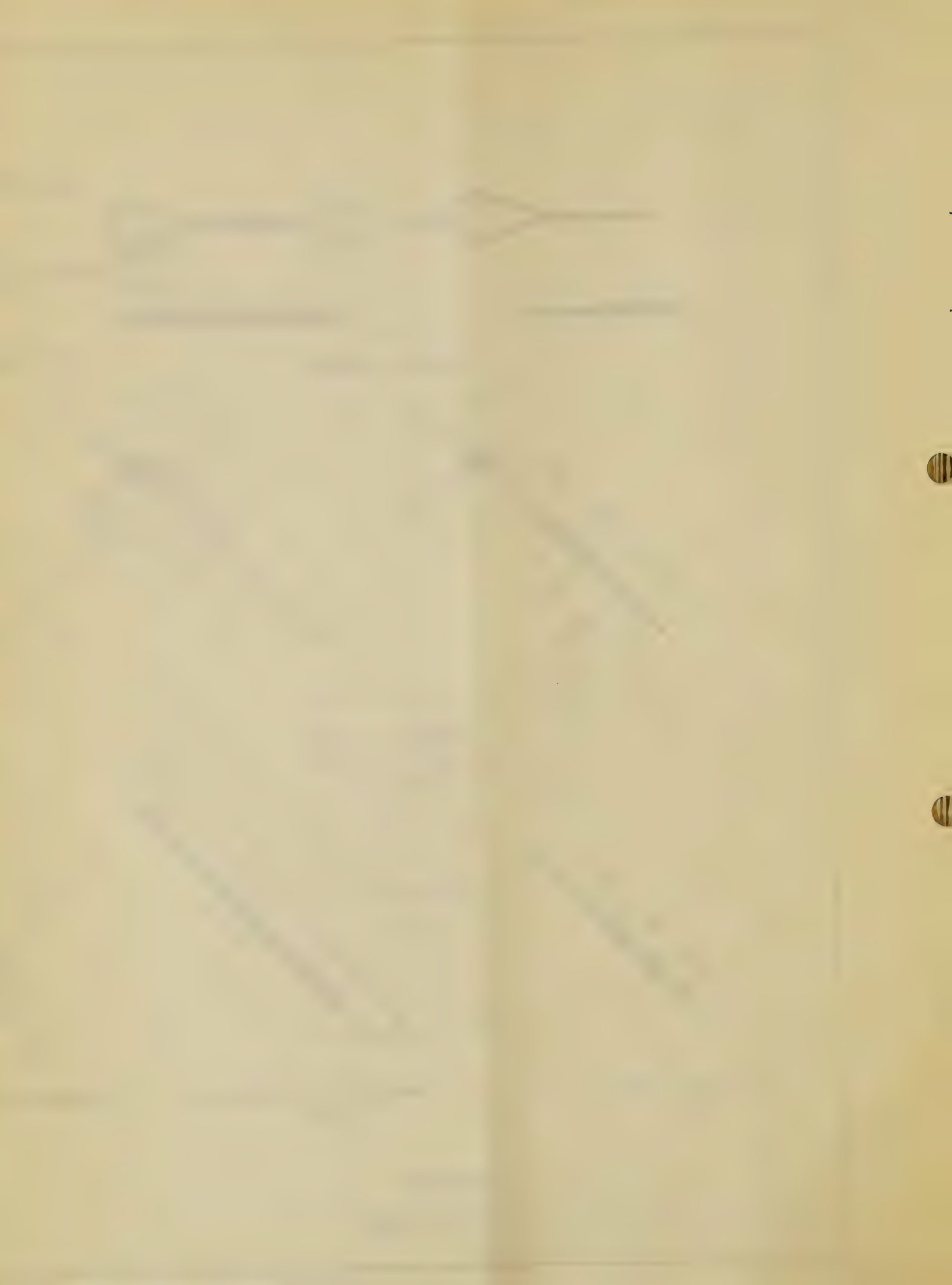
TRANSMISSION LINE TANGENT STRUCTURE

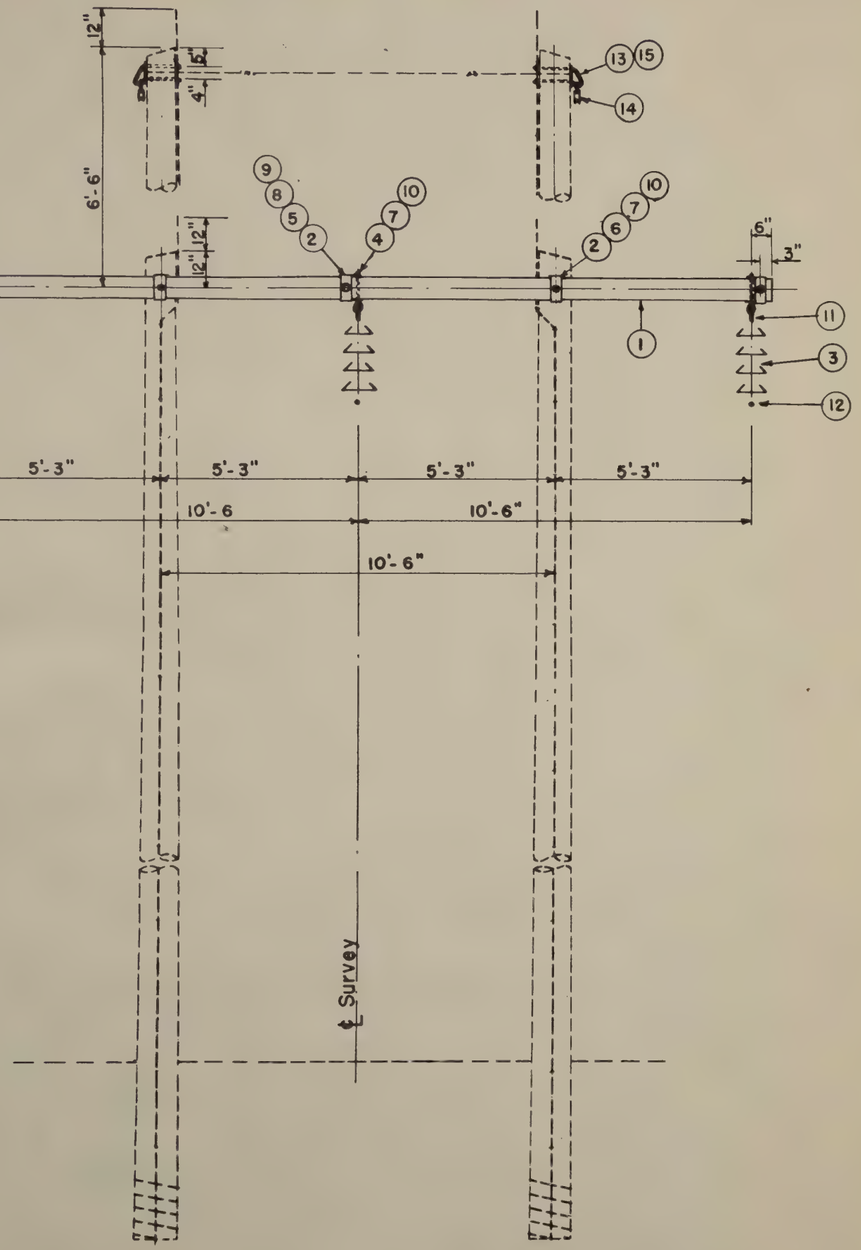
____KV. SINGLE POLE SUSPENSION- WITH BRACKETS

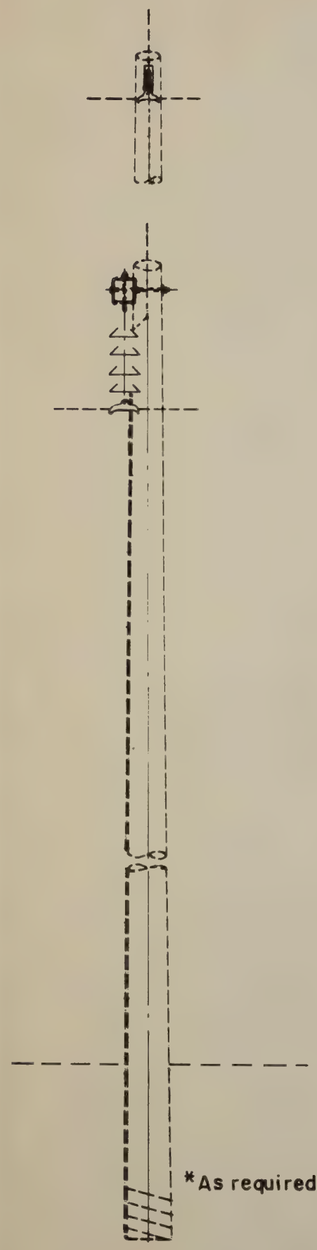
(69 KV. MAXIMUM)

Scale: 3/8"=1'-0"		Date:
		TS-7

946698 O—51 (Fold-in No. 12)







*As required. See Drg. TM-1

NOTE:

Make one turn of downlead underneath washer around overhead ground wire support bolts, and staple to pole so that it does not come in contact with crossarms or through bolts.

Designation without Overhead Ground is TH-1.

Designation with Overhead Ground is TH-1G.

LIST OF MATERIAL

DR'G REF.	REQ'D	DESCRIPTION	ITEM
1	1	$5\frac{3}{4}$"x$7\frac{3}{4}$"x 22'-0" Wood Crossarm	g
2	8	Reinforcing Plate for 8" Crossarm	eg
3	*	5 3/4"x 10" Suspension Insulator	k
4	3	3/4"x 10" Eye Bolt	o
5	3	1/2"x 8" Machine Bolt	c
6	2	3/4"x 18" Machine Bolt	c
7	8	4"x4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
8	6	1 3/8" Galv. Round Washer, 9/16" Hole	d
9	3	Locknuts for 1/2" Bolt	ek
10	5	Locknuts for 3/4" Bolt	ek
11	3	Suspension Hook	eh
12	3	Suspension Clamp and Connecting Piece	ei

ADDITIONAL MATERIAL FOR TH-1G

13	2	Ground Wire Cable Support	ed
14	2	Ground Wire Suspension Clamp	m
15	4	Locknuts for 5/8" Bolt	ek

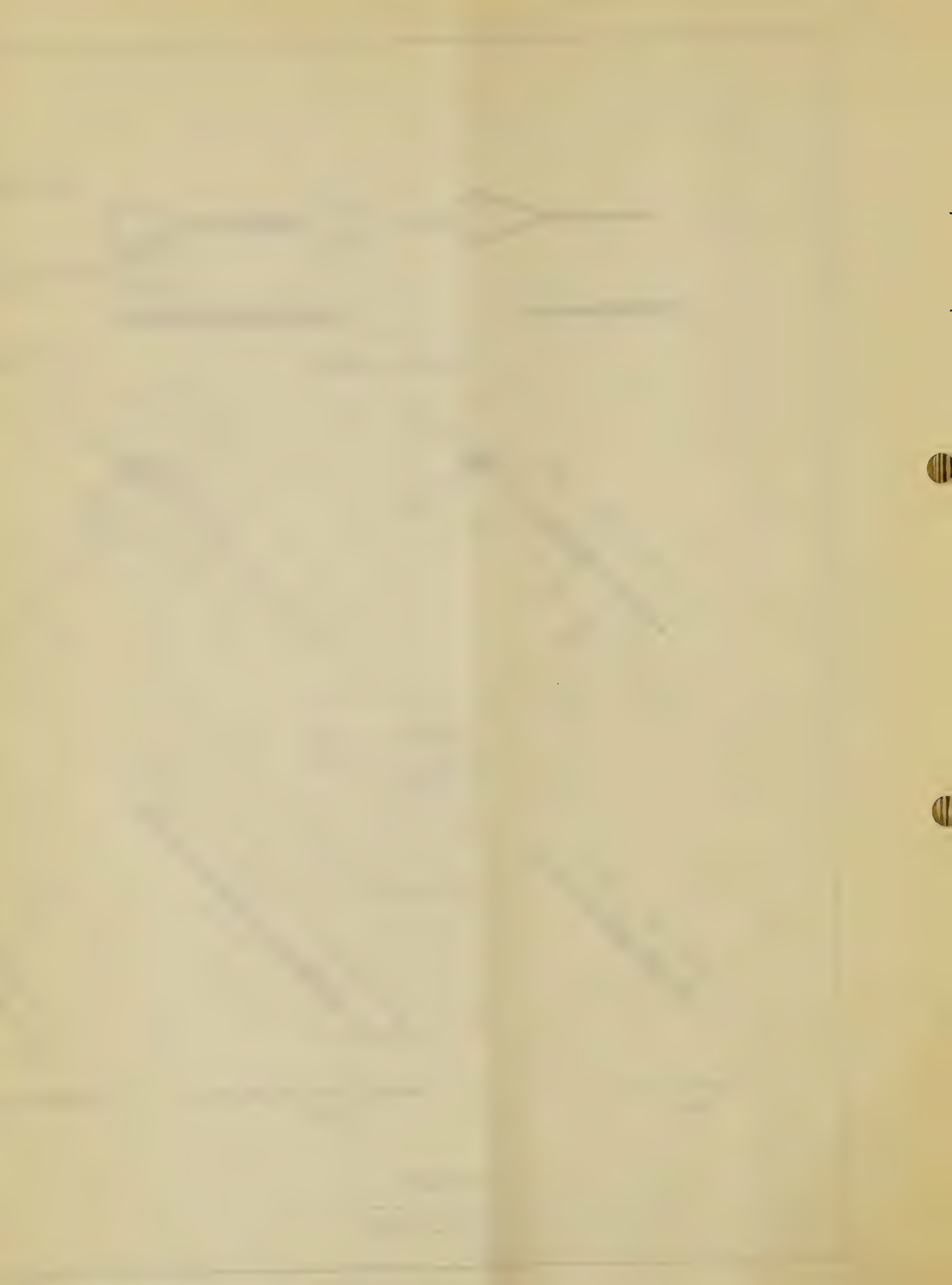
TRANSMISSION LINE TANGENT STRUCTURE
____KV. H-FRAME SUSPENSION - TWO POLE
(34.5 TO 69 KV.)

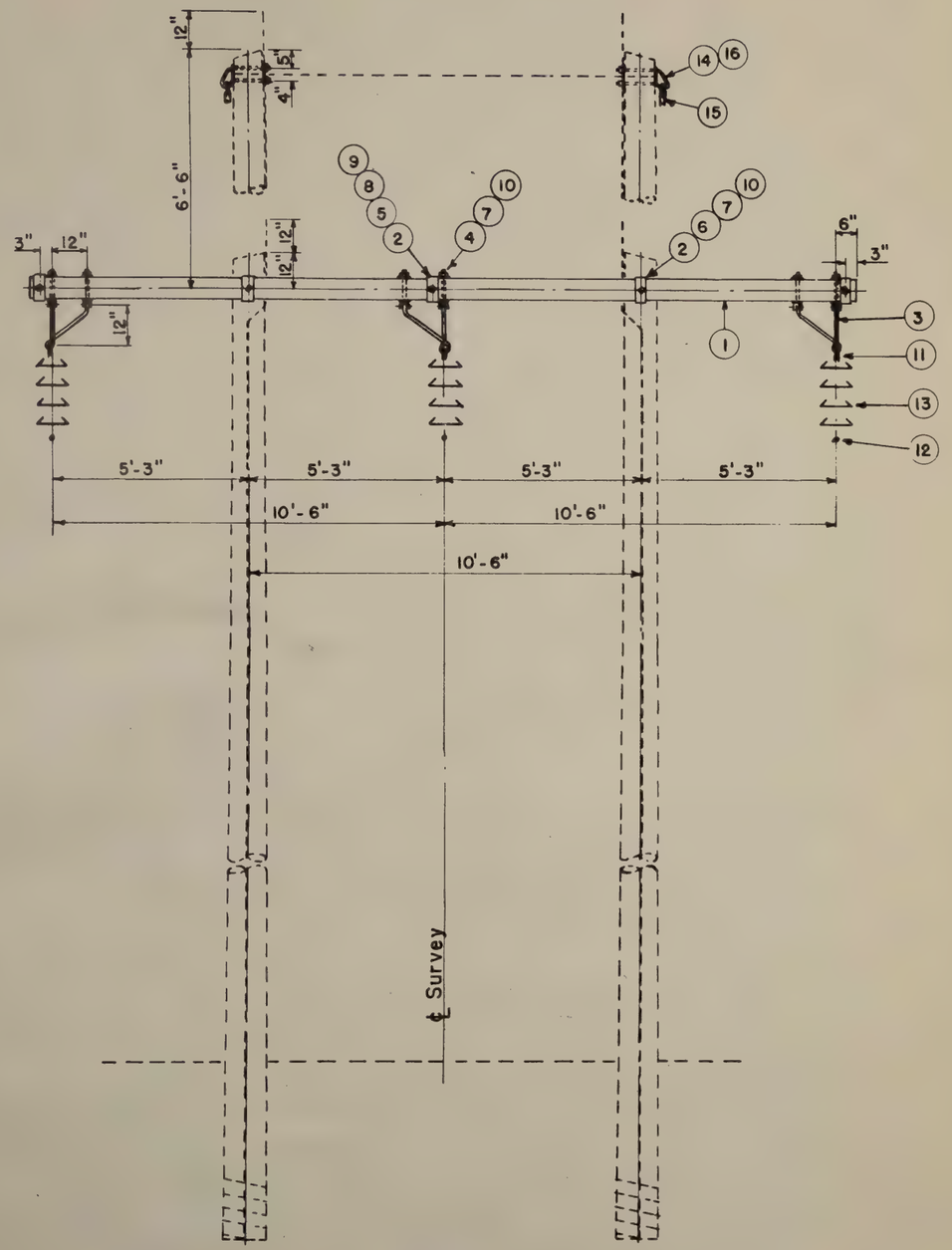
Scale: 1/4"=1'-0"

Date: 11-49

TH-1, TH-1G

946698 O—51 (Fold-in No. 13)





*As required. See Drg. TM-1.

NOTE

Make one turn of downlead underneath washer around overhead ground wire support bolts and staple to pole so that it does not come in contact with crossarm or through bolts.

Designation without Overhead Ground is TH-1B.

Designation with Overhead Ground is TH-1BG.

LIST OF MATERIAL

DR'G REF.	REQ'D	DESCRIPTION	ITEM
1	1	5¾"x7¾" x 22'-0" Wood Crossarm	g
2	8	Reinforcing Plate for 8" Crossarm	eg
3	3	3/4" Angle Bracket	cr
4	6	3/4"x 10" Clevis Bolt	ef
5	3	1/2"x 8" Machine Bolt	c
6	2	3/4"x 18" Machine Bolt	c
7	14	4"x 4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
8	6	1 3/8" Galv. Round Washer, 9/16" Hole	d
9	3	Locknuts for 1/2" Bolt	ek
10	8	Locknuts for 3/4" Bolt	ek
11	3	Suspension Hook	eh
12	3	Suspension Clamp and Connecting Piece	ei
13	*	5 3/4"x 10" Suspension Insulator	k

ADDITIONAL MATERIAL FOR TH-1BG

14	2	Ground Wire Cable Support	ed
15	2	Ground Wire Suspension Clamp	m
16	4	Locknuts for 5/8" Bolt	ek

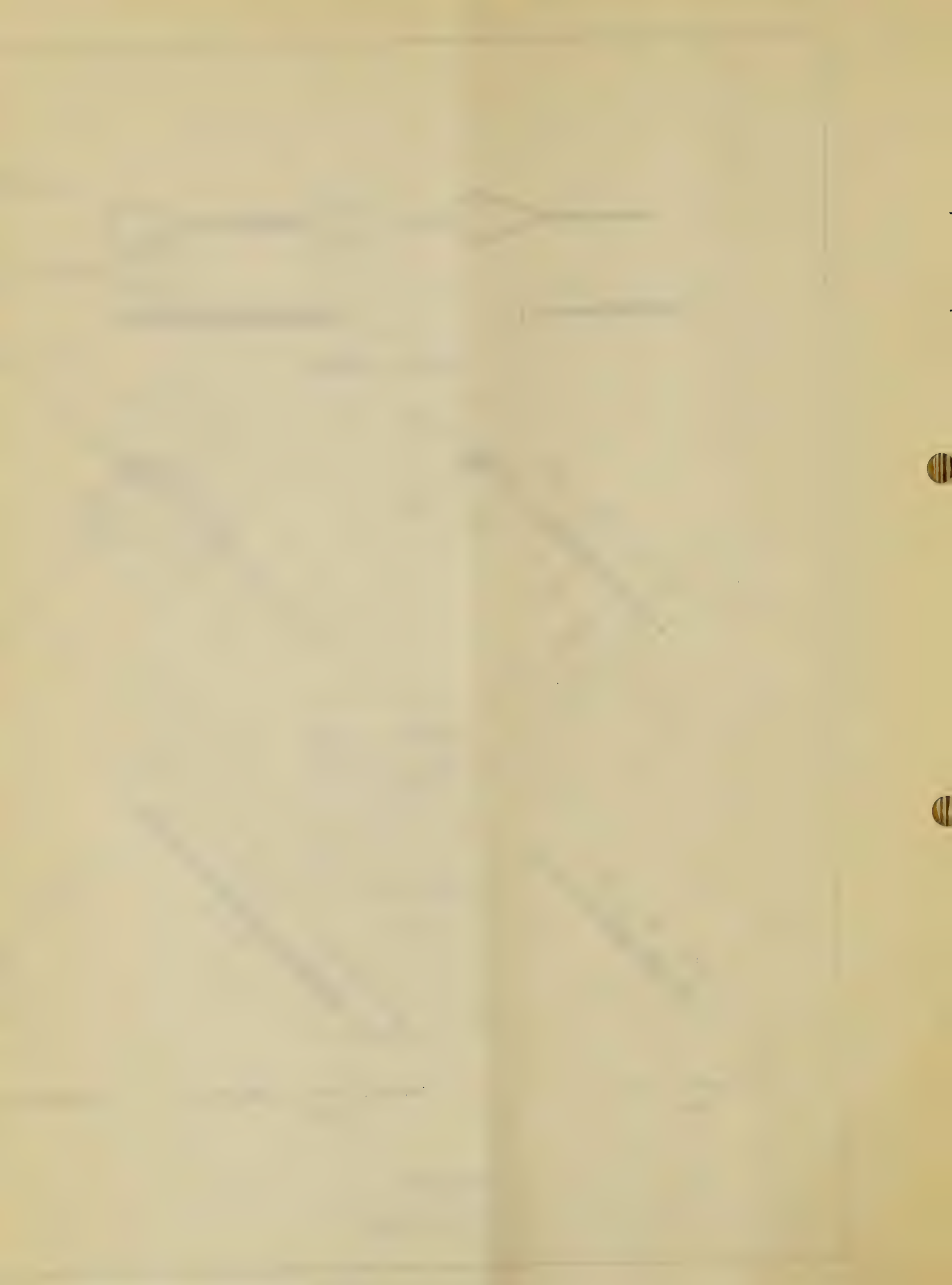
TRANSMISSION LINE TANGENT STRUCTURE

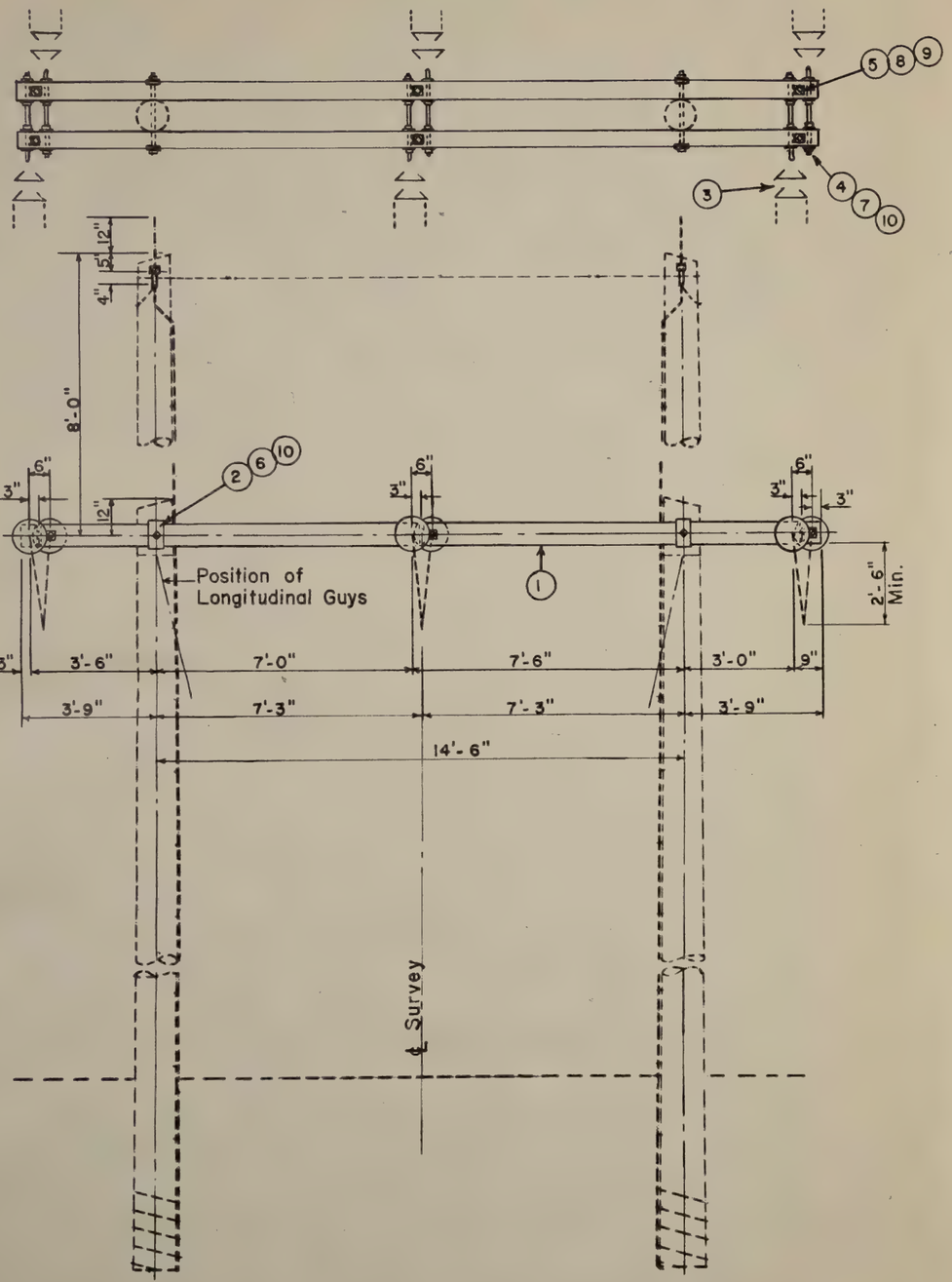
___KV. H-FRAME SUSPENSION-TWO POLE-BRACKETS

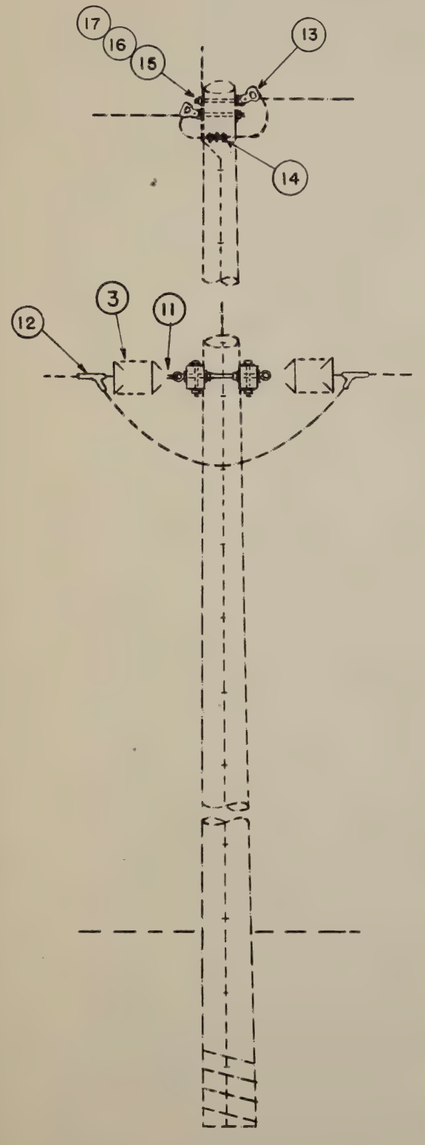
(69 KV. MAXIMUM)

Scale: 1/4"=1'-0"		Date: 11-49
		TH-1B, TH-1BG

946698 O—51 (Fold-in No. 14)







NOTE:

Make one turn of downlead underneath washer around overhead ground wire support bolts, and staple downlead so that it does not come in contact with crossarms or through bolts.

* As required, see Drg. TM-1
Designation with Overhead Ground Wire is TH-2G
Designation without Overhead Ground Wire is TH-2

LIST OF MATERIAL

DRG. REF.	REQD	DESCRIPTION	ITEM
1	2	5¾"×7¾" x 22'-0" Wood Crossarm	g
2	4	Reinforcing Plate for 8" Crossarm	eg
3	*	5 3/4" x 10" Suspension Insulator	k
4	6	3/4" x 26" Double Arm Eye Bolt	o
5	6	5/8" x 10" Machine Bolt	c
6	2	3/4" x 26" Machine Bolt	c
7	24	4" x 4" x 3/16" Galv. Sq. Washer, 13/16" Hole	d
8	12	2 1/4" x 2 1/4" x 3/16" Galv. Sq. Washer, 13/16" Hole	d
9	6	Locknuts for 5/8" Bolt	ek
10	8	Locknuts for 3/4" Bolt	ek
11	6	Suspension Hook	eh
12	6	Dead End Clamp and Connecting Piece	ej

ADDITIONAL MATERIAL FOR TH-2G			
13	4	Ground Wire Dead End Clamp	l
14	2	6"- 3 Bolt Clamp	u
15	4	5/8" x 14" Eye Bolt	o
16	8	2 1/4" x 2 1/4" x 3/16" Galv. Sq. Washer, 13/16" Hole	d
17	4	Locknuts for 5/8" Bolt	ek

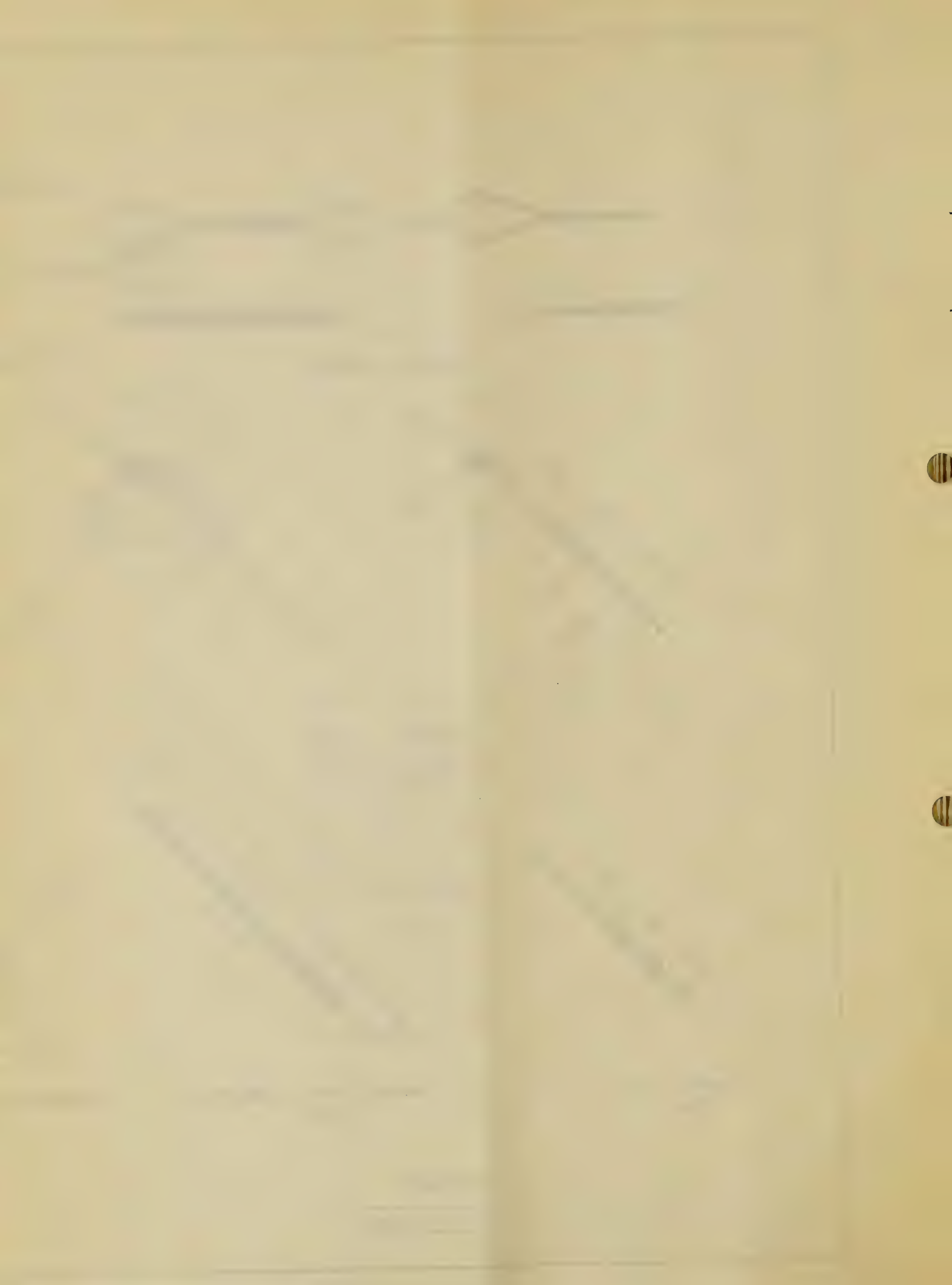
TRANSMISSION LINE DEAD END STRUCTURE
_____KV. TWO POLE DOUBLE DEAD END
(34.5 TO 69 KV.)

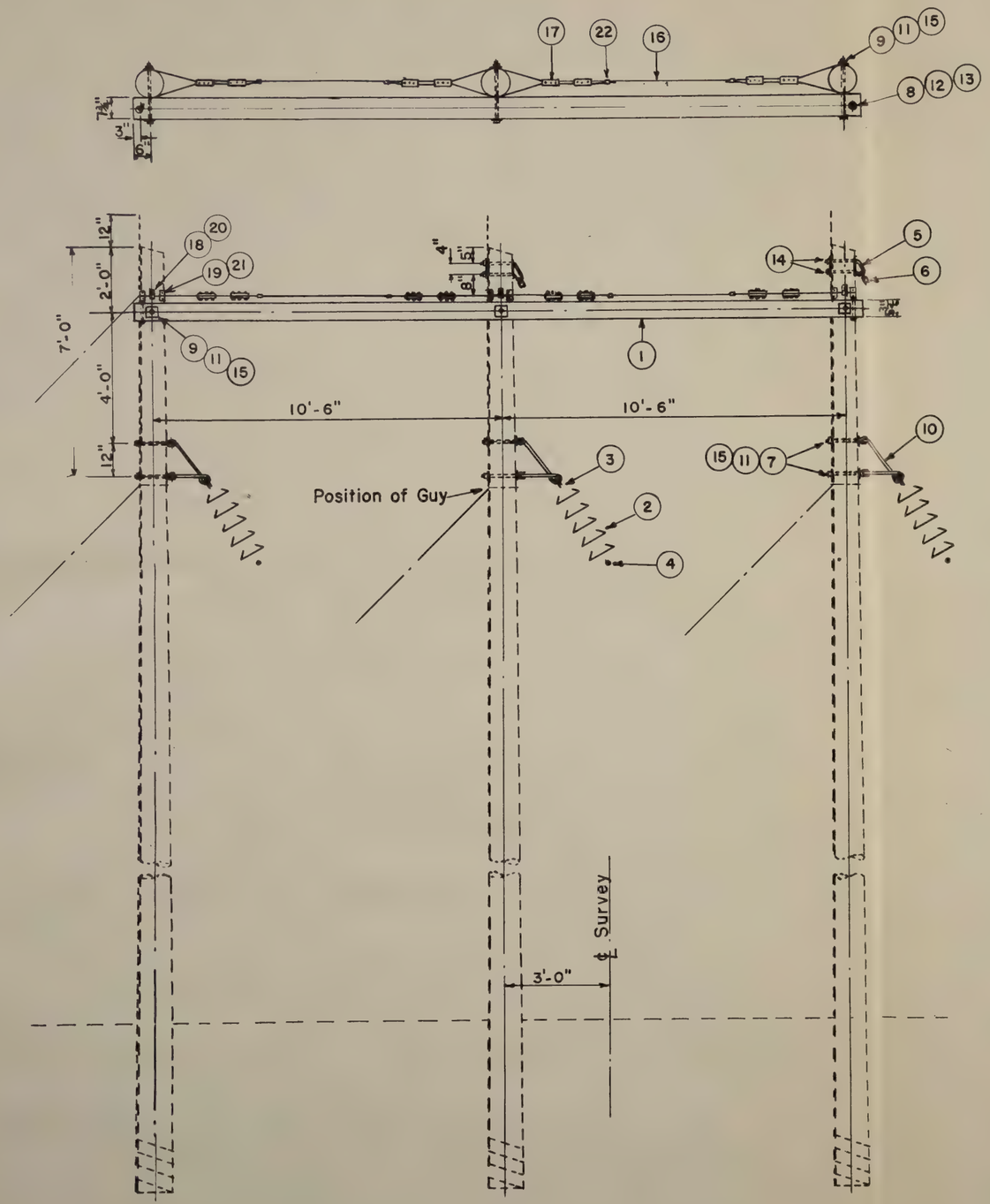
Scale: 1/4"=1'-0"

Date: 5 - 51

TH-2,2G

946698 O—51 (Fold-in No. 15)





*As required. See Drg. TM-1

NOTE

Make one turn of downlead underneath washers around conductor support bolts and overhead ground wire support bolts.

LIST OF MATERIAL

DR'G REF.	REQ'D	DESCRIPTION	ITEM
1	1	5¾"x7¾" x 22'-0" Wood Crossarm	g
2	*	5 3/4" x 10" Suspension Insulator	k
3	3	Suspension Hook	eh
4	3	Suspension Clamp and Connecting Piece	ei
5	2	Ground Wire Cable Support	ed
6	2	Ground Wire Suspension Clamp	m
7	6	3/4" x 14" Clevis Bolt	ef
8	2	1/2" x 8" Machine Bolt	c
9	3	3/4" x 20" Machine Bolt	c
10	3	3/4" Angle Bracket	cr
11	18	4" x 4" x 3/16" Galv. Sq. Washer, 13/16" Hole	d
12	4	1 3/8" Galv. Round Washer, 9/16" Hole	d
13	2	Locknuts for 1/2" Bolt	ek
14	4	Locknuts for 5/8" Bolt	ek
15	9	Locknuts for 3/4" Bolt	ek
16	50'	Guy Wire	y
17	8	3 Bolt Guy Clamp - 6" Long	u
18	6	Guy Hook	bj
19	6	Guy Plate	bk
20	6	1/2" x 4" Lag Screw	j
21	3/16*	6 d Copperweld Nails	bp
22	4	Guy Clip	dz

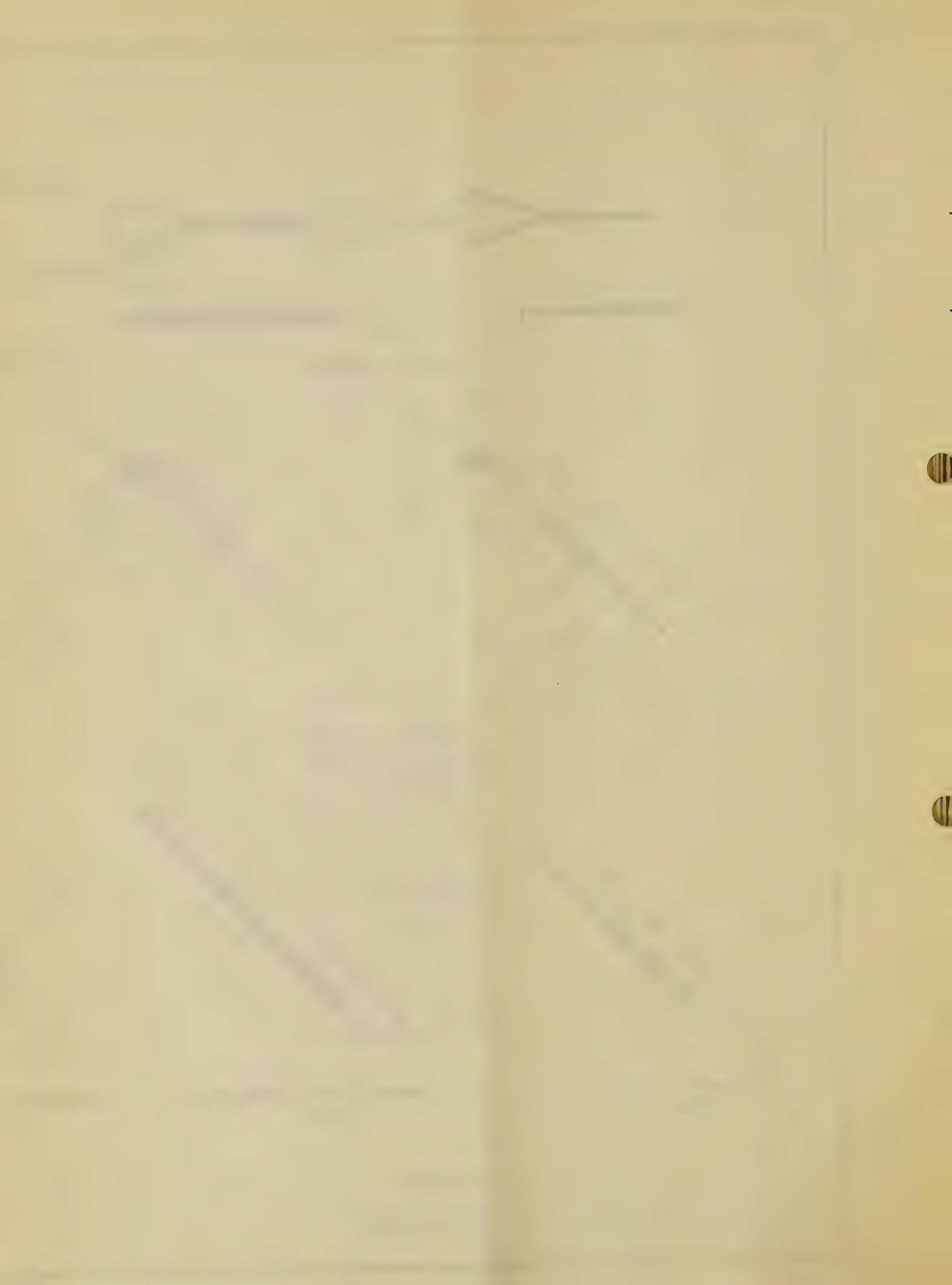
TRANSMISSION LINE MEDIUM ANGLE STRUCTURE

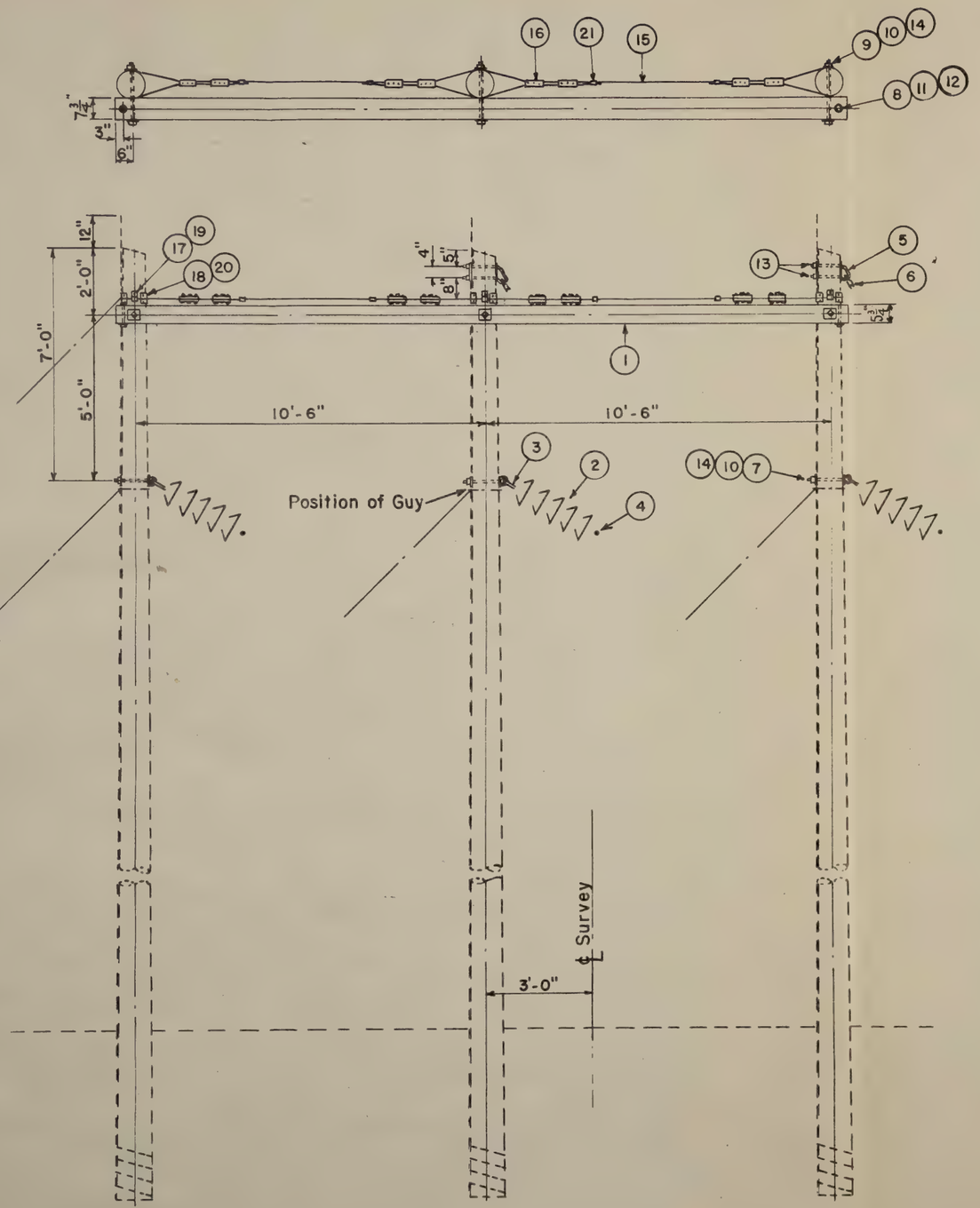
____ KV. H-FRAME SUSPENSION-THREE POLE

69 KV. MAXIMUM - 10'-6" POLE SPACING

Scale: 1/4"=1'-0"		Date: 11-49
		TH-3

946698 O—51 (Fold-in No. 16)





NOTE

Make one turn of downlead underneath washers around conductor support bolts and overhead ground wire support bolts.

LIST OF MATERIAL			
DR'G REF.	REQ'D	DESCRIPTION	ITEM
1	1	5¾"x7¾" x 22'-0" Wood Crossarm	g
2	*	5 3/4"x 10" Suspension Insulator	k
3	3	Suspension Hook	eh
4	3	Suspension Clamp and Connecting Piece	ei
5	2	Ground Wire Cable Support	ed
6	2	Ground Wire Suspension Clamp	m
7	3	3/4"x 14" Eye Bolt	o
8	2	1/2"x 8" Machine Bolt	c
9	3	3/4"x 20" Machine Bolt	c
10	12	4"x 4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
11	4	1 3/8" Galv. Round Washer, 9/16" Hole	d
12	2	Locknuts for 1/2" Bolt	ek
13	4	Locknuts for 5/8" Bolt	ek
14	6	Locknuts for 3/4" Bolt	ek
15	46'	Guy Wire	y
16	8	3 Bolt Guy Clamp - 6" Long	u
17	6	Guy Hook	bj
18	6	Guy Plate	bk
19	6	1/2"x 4" Lag Screw	j
20	3/16*	6 d Copperweld Nails	bp
21	4	Guy Clip	dz

*As required. See Drg. TM-1

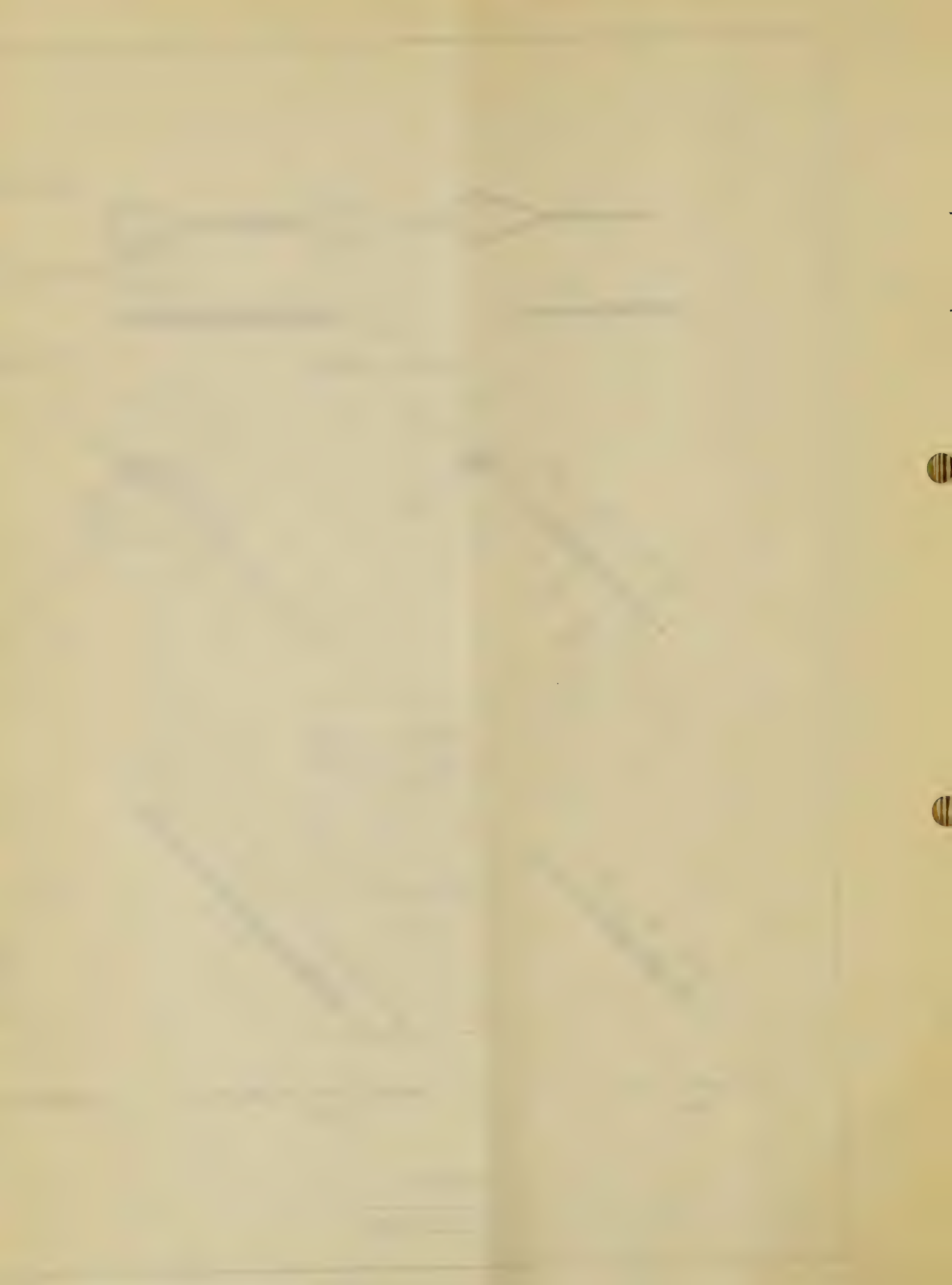
TRANSMISSION LINE LARGE ANGLE STRUCTURE

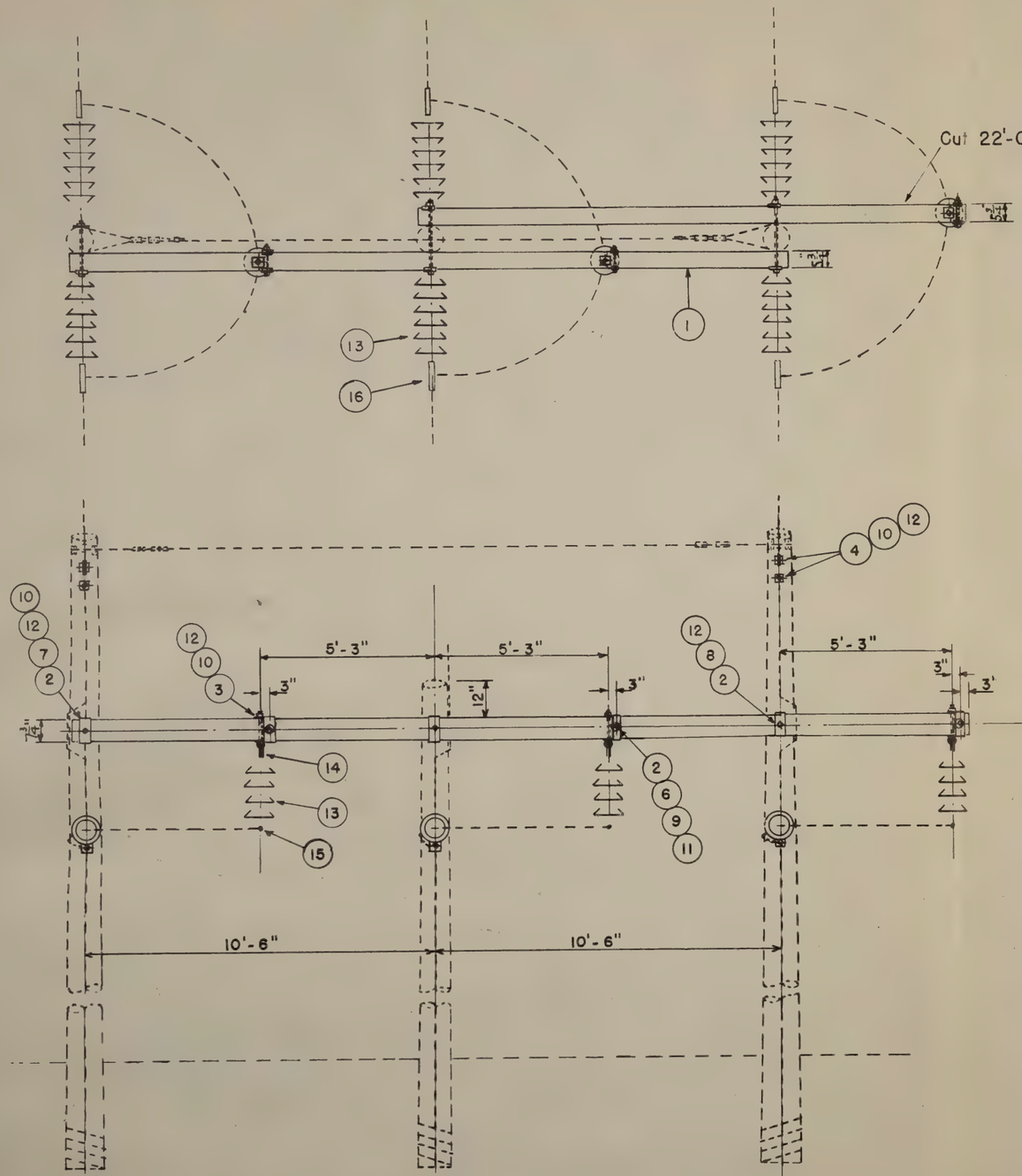
____KV. H-FRAME SUSPENSION-THREE POLE

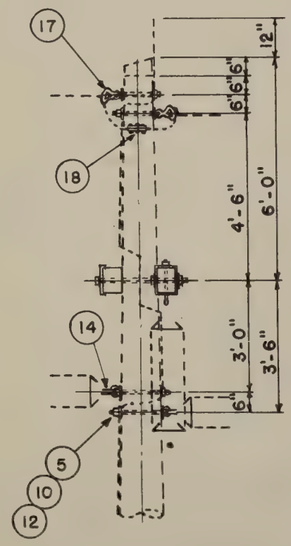
69 KV. MAXIMUM - 10'-6" POLE SPACING

Scale: 1/4"=1'-0"		Date: 11-49
		TH-4

946698 O—51 (Fold-In No. 17)







*As required. See Drg. TM-1

LIST OF MATERIAL			
DR'G. REF.	REQ'D	DESCRIPTION	ITEM
1	2	5¾"x7¾"x22'-0" Wood Crossarm	g
2	11	Reinforcing Plate for 8" Crossarm	eg
3	3	3/4" x 10" Eye Bolt	o
4	4	3/4"x 12" Eye Bolt	o
5	6	3/4"x 14" Eye Bolt	o
6	3	1/2"x 8" Machine Bolt	c
7	1	3/4"x 20" Machine Bolt	c
8	2	3/4"x 26" Machine Bolt	c
9	6	1 3/8" Galv. Round Washer, 9/16" Hole	d
10	27	4"x 4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
11	3	Locknuts for 1/2" Bolt	ek
12	16	Locknuts for 3/4" Bolt	ek
13	*	5 3/4"x 10" Suspension Insulator	k
14	9	Suspension Hook	eh
15	3	Suspension Clamp and Connecting Piece	ei
16	6	Conductor Dead End Clamp and Connecting Piece	ej
17	4	Ground Wire Dead End Clamp	l
18	2	3 Bolt Clamp - 6" Long	u

NOTE

Make one turn of downlead underneath washers around conductor support bolts and overhead ground wire support bolts, and staple to pole so that it does not come in contact with crossarms or through bolts.

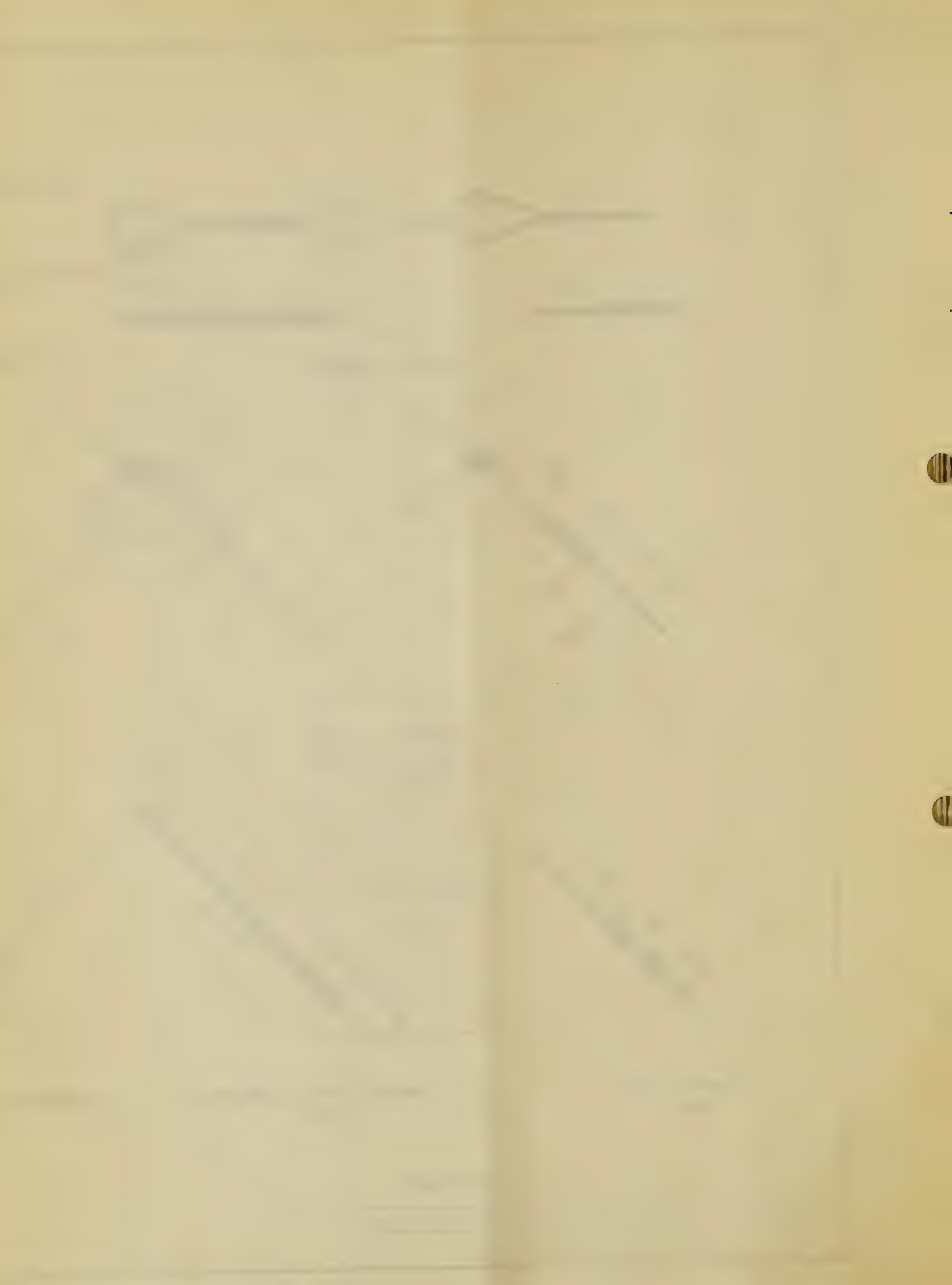
TRANSMISSION LINE DEAD END STRUCTURE

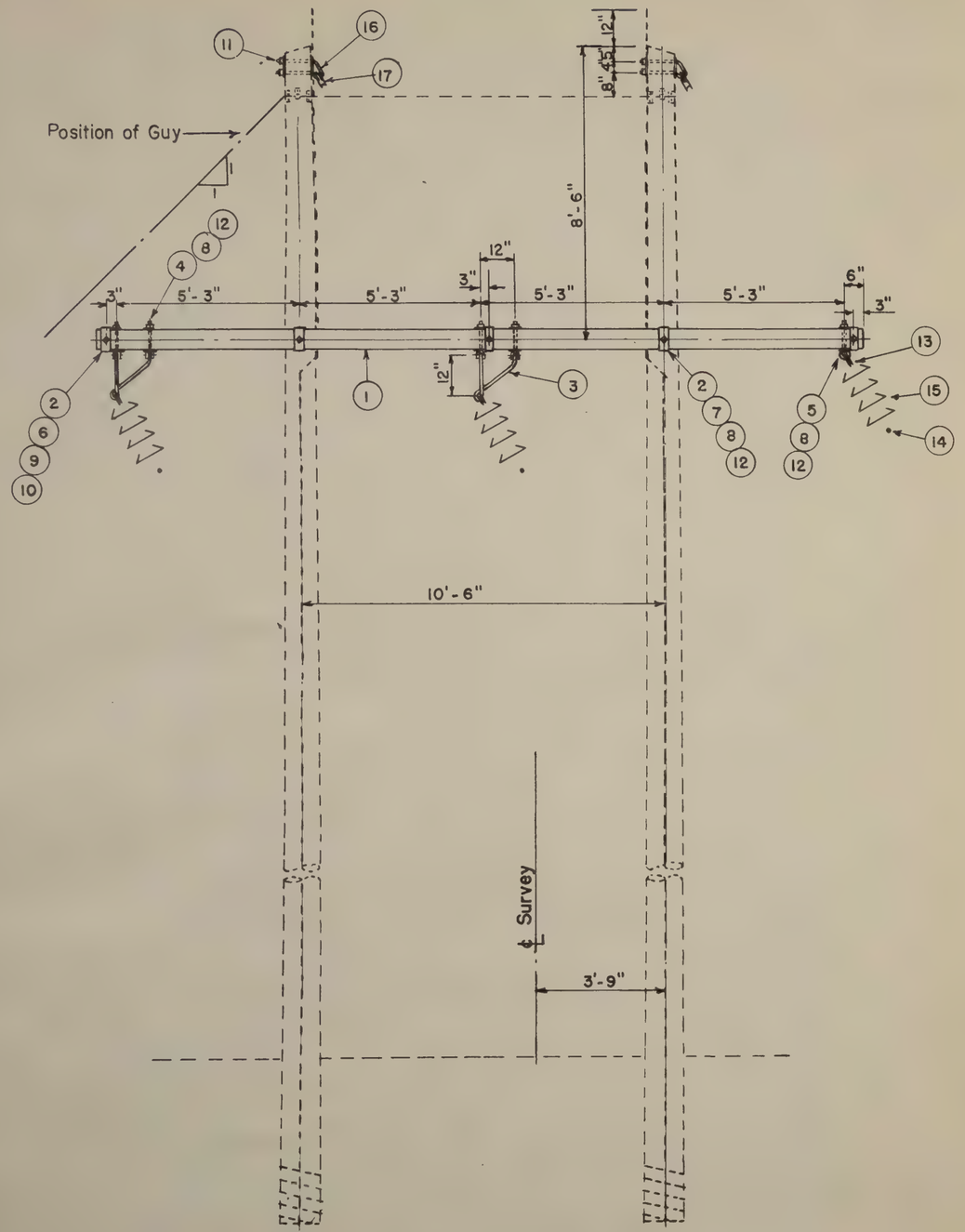
___ KV. THREE POLE DOUBLE DEAD END

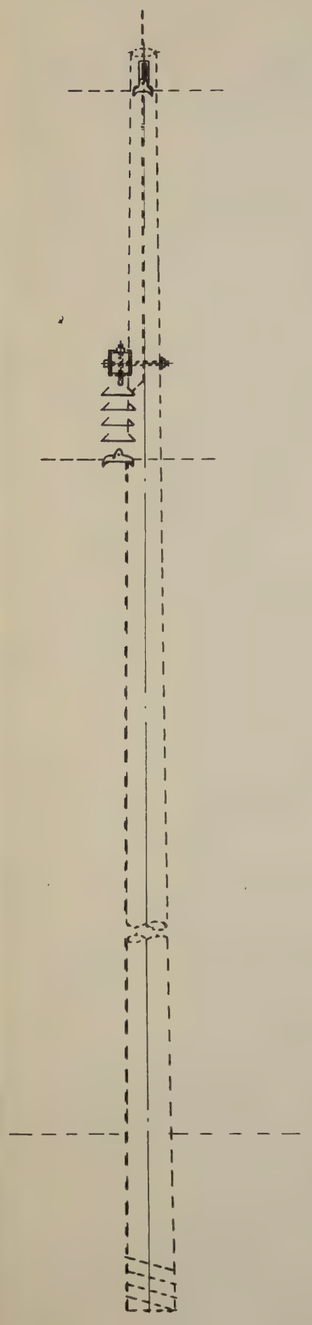
69 KV. MAXIMUM - 10'-6" POLE SPACING

Scale: 1/4"=1'-0"		Date: 11-49
		TH-5

946698 O—51 (Fold-in No. 18)







NOTE

Make one turn of downlead underneath washer around overhead ground wire support bolts and staple to pole so that it does not come in contact with crossarm or through bolts.

LIST OF MATERIAL

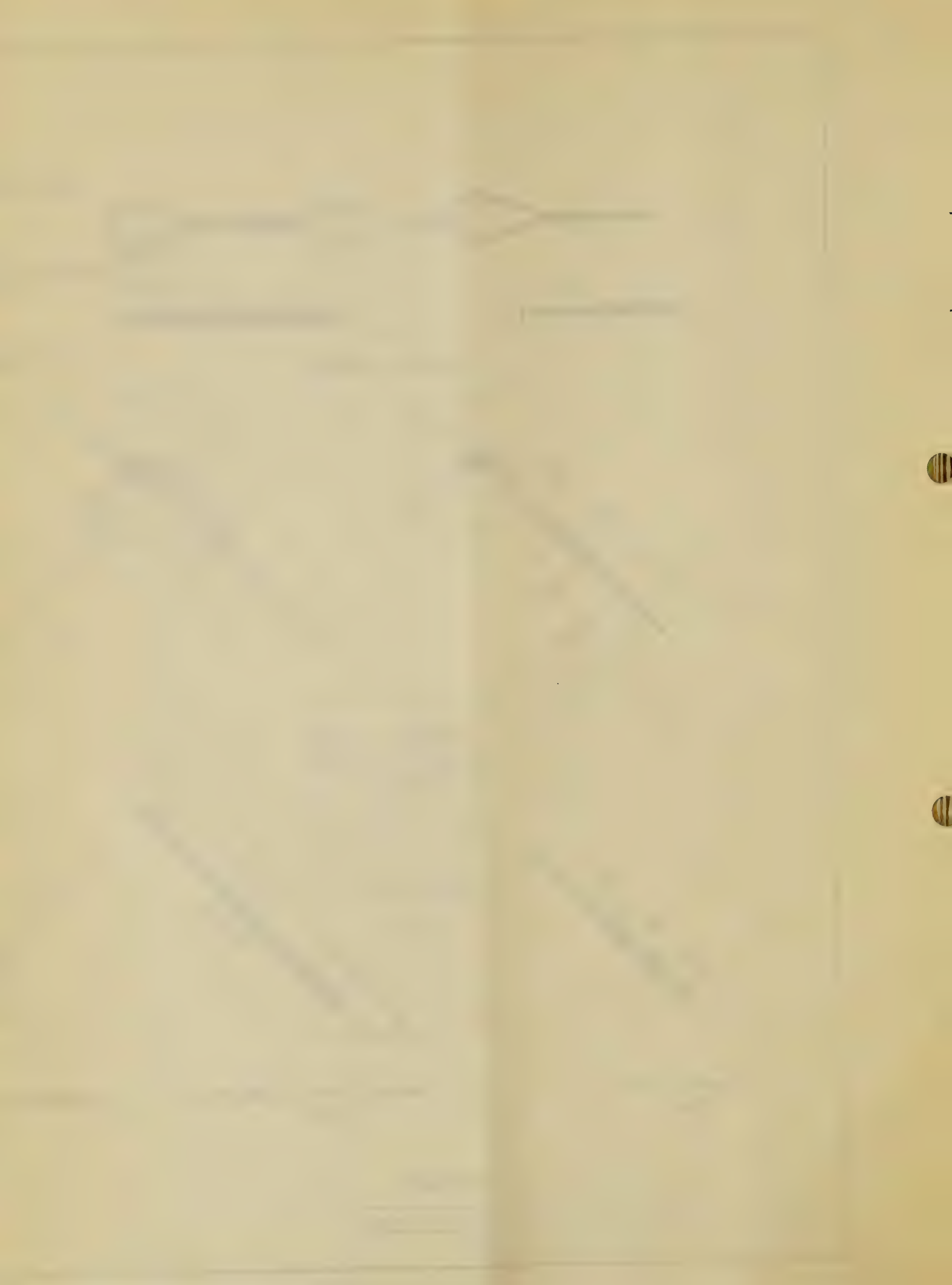
DR'G REF.	REQ'D	DESCRIPTION	ITEM
1	1	5¾"x7¾"x22'-0" Wood Crossarm	g
2	8	Reinforcing Plate for 8" Crossarm	eg
3	2	3/4" Angle Bracket	cr
4	4	3/4"x 10" Clevis Bolt	ef
5	1	3/4"x 10" Eye Bolt	o
6	3	1/2"x 8" Machine Bolt	c
7	2	3/4"x 18" Machine Bolt	c
8	12	4"x 4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
9	6	1 3/8" Galv. Round Washer, 9/16" Hole	d
10	3	Locknuts for 1/2" Bolt	ek
11	4	Locknuts for 5/8" Bolt	ek
12	7	Locknuts for 3/4" Bolt	ek
13	3	Suspension Hook	eh
14	3	Suspension Clamp and Connecting Piece	ei
15	12	5 3/4"x 10" Suspension Insulator	k
16	2	Ground Wire Cable Support	ed
17	2	Ground Wire Suspension Clamp	m

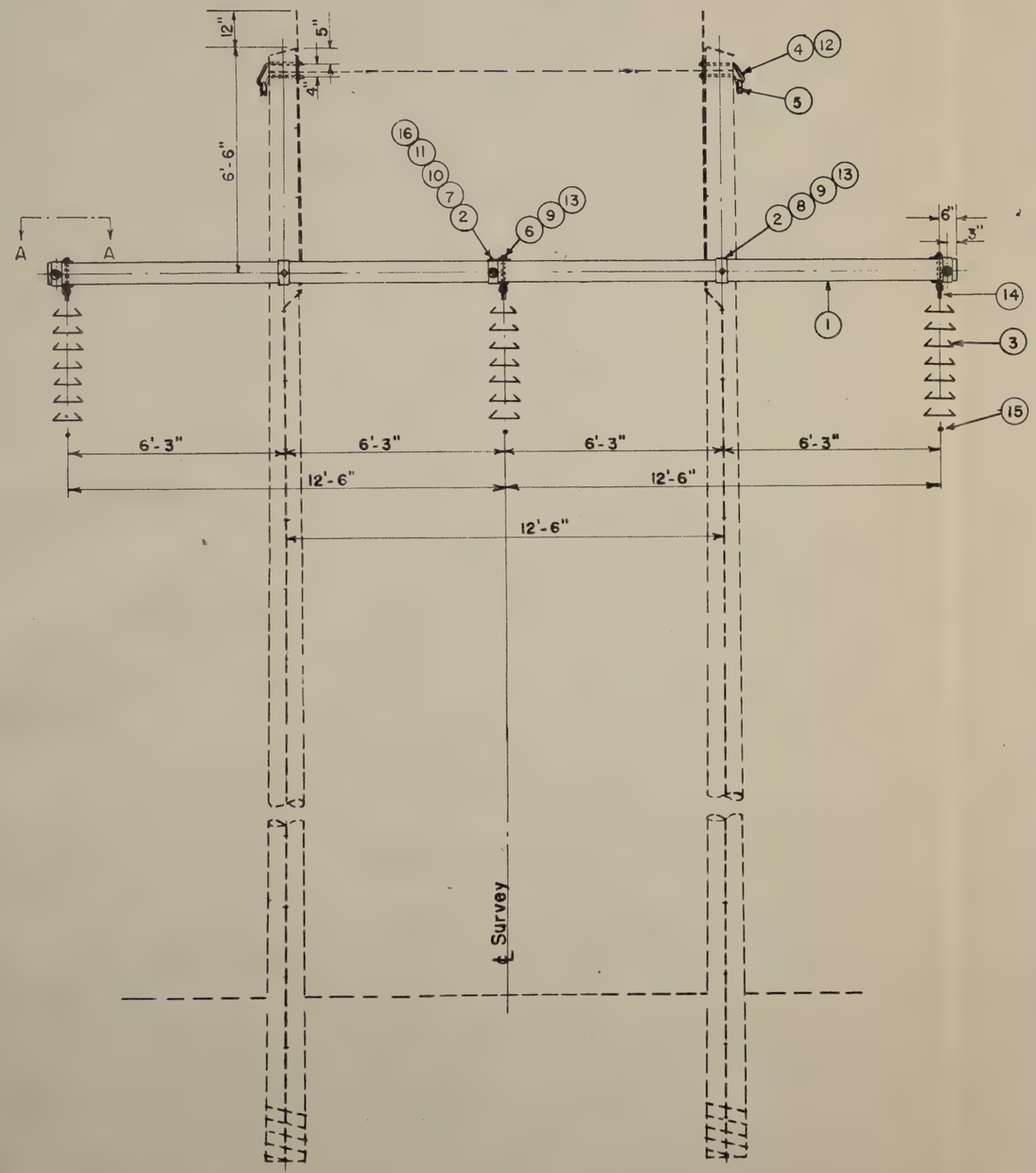
TRANSMISSION LINE MEDIUM ANGLE STRUCTURE

___KV. H-FRAME SUSPENSION - TWO POLE WITH BRACKETS (69 KV. MAXIMUM)

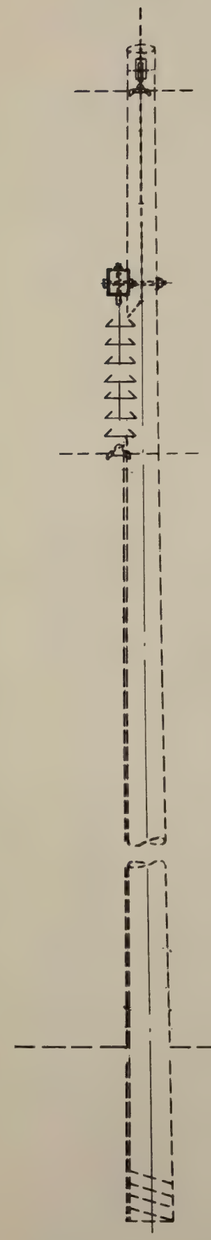
Scale: 1/4"=1'-0"		Date: 11-4-9
		TH-6

946698 O—51 (Fold-in No. 19)

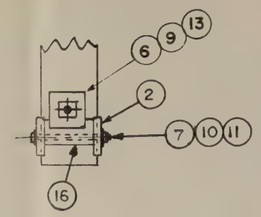




NOTE:
Make one turn of downlead underneath washer around overhead ground wire support bolts, and staple to pole so that it does not come in contact with crossarms or through bolts.



* As required. See Drg. TM-1



SECTION "A-A"

LIST OF MATERIAL

DRG. REF.	REQ'D	DESCRIPTION	ITEM
1	1	5¾"x7¾"x26'-0" Wood Crossarm	g
2	8	Reinforcing Plate for 8" Crossarm	eg
3	*	5 3/4"x10" Suspension Insulator	k
4	2	Ground Wire Cable Support	ed
5	2	Ground Wire Suspension Clamp	m
6	3	3/4"x10" Eye Bolt	o
7	3	1/2"x 8" Machine Bolt	c
8	2	3/4"x18" Machine Bolt	c
9	8	4"x4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
10	6	1 3/8" Galv. Round Washer, 9/16" Hole	d
11	3	Locknuts for 1/2" Bolt	ek
12	4	Locknuts for 5/8" Bolt	ek
13	5	Locknuts for 3/4" Bolt	ek
14	3	Suspension Hook	eh
15	3	Suspension Clamp and Connecting Piece	ei
16	3	3"x8"x30 Ga. Copper Strip	

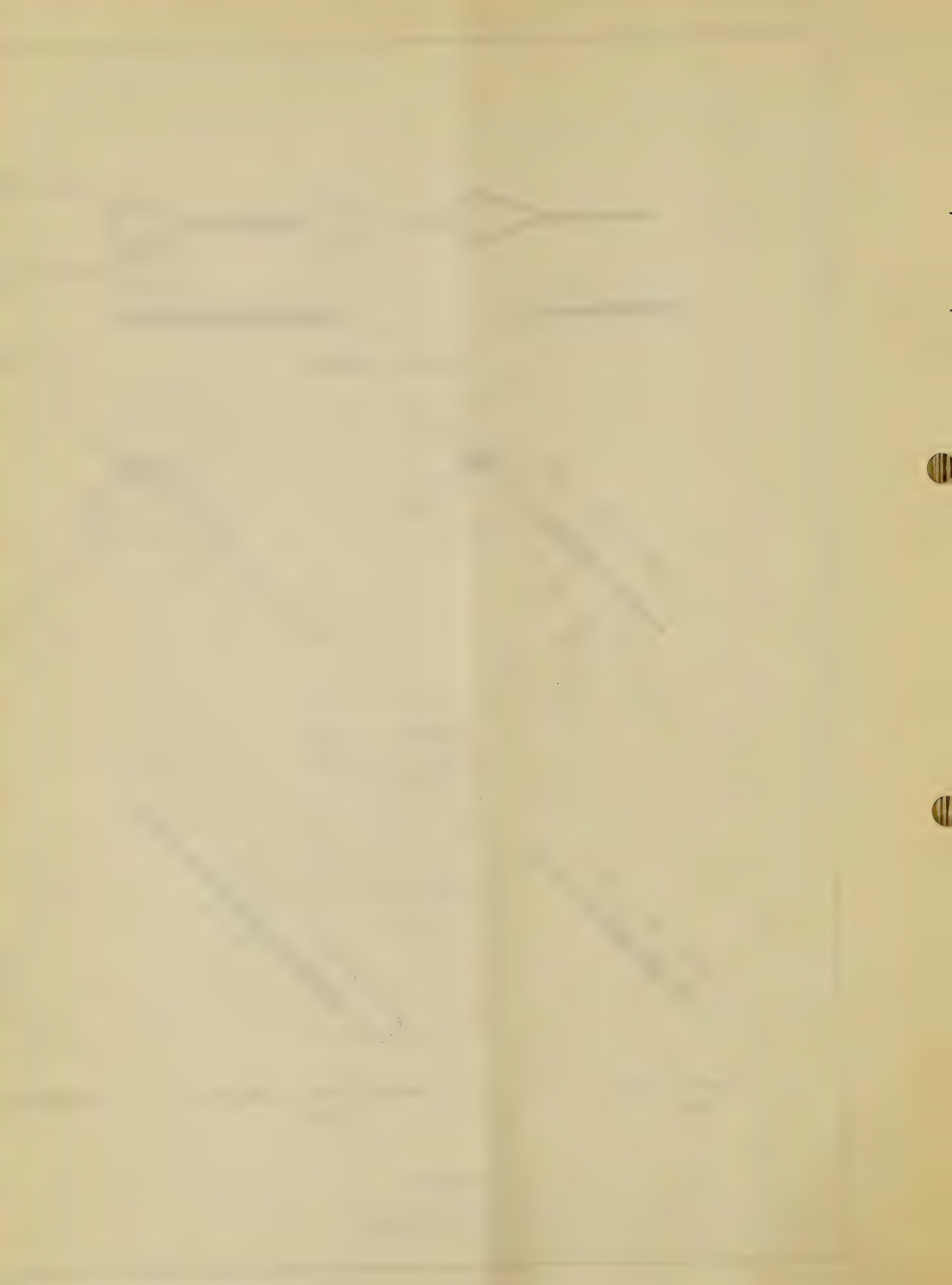
TRANSMISSION LINE TANGENT STRUCTURE
___ KV. H-FRAME SUSPENSION- TWO POLE
(115 KV. MAXIMUM)

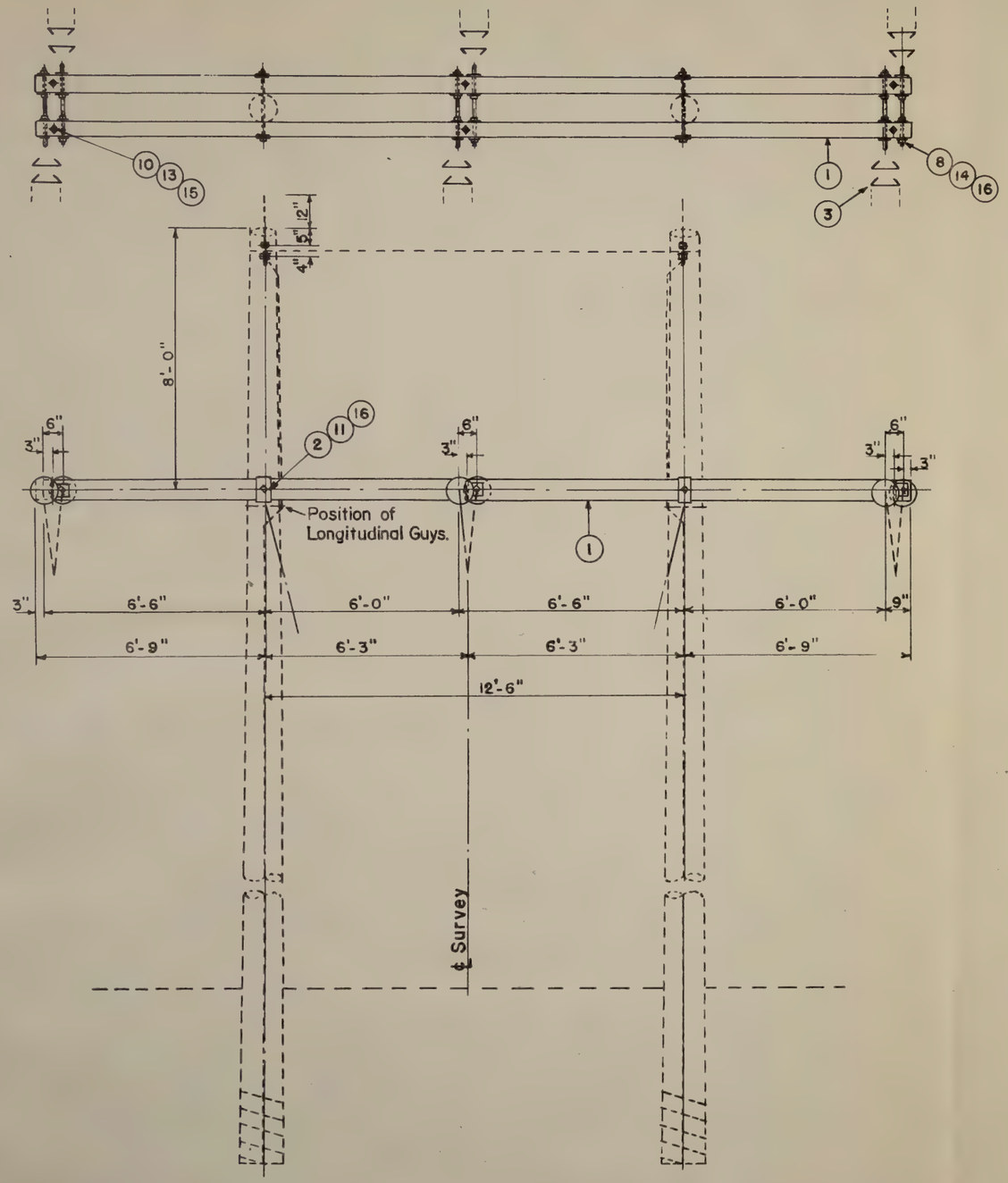
Scale: 1/4"=1'-0"

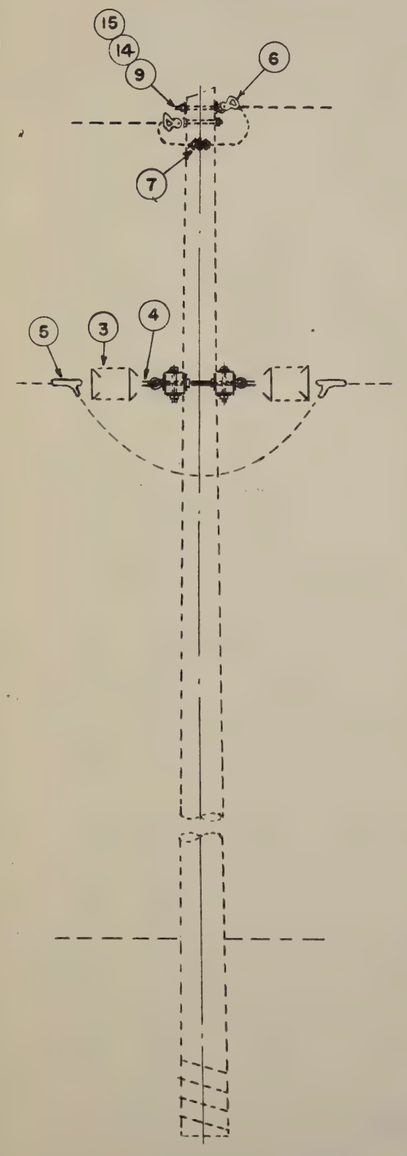
Date: 11-49

TH-1 A

946698 O—51 (Fold-in No. 20)







* As required. See Drg. TM-1

NOTE

Make one turn of downlead underneath washer around overhead ground wire support bolts, and staple downlead so that it does not come in contact with crossarms or through bolts.

LIST OF MATERIAL

DR'G REF.	REQ'D	DESCRIPTION	ITEM
1	2	5¾"x7¾"x 26'-0" Wood Crossarm	g
2	4	Reinforcing Plate for 8" Crossarm	eg
3	*	5 3/4"x 10" Suspension Insulator	k
4	6	Suspension Hook	eh
5	6	Dead End Clamp and Connecting Piece	ej
6	4	Ground Wire Dead End Clamp	l
7	2	6"- 3 Bolt Clamp	u
8	6	3/4"x 26" Double Arm Eyebolt	o
9	4	3/4"x 12" Eyebolt	o
10	6	5/8"x 10" Machine Bolt	c
11	2	3/4"x 26" Machine Bolt	c
12			
13	12	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
14	32	4"x4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
15	6	Locknuts for 5/8" Bolt	ek
16	12	Locknuts for 3/4" Bolt	ek

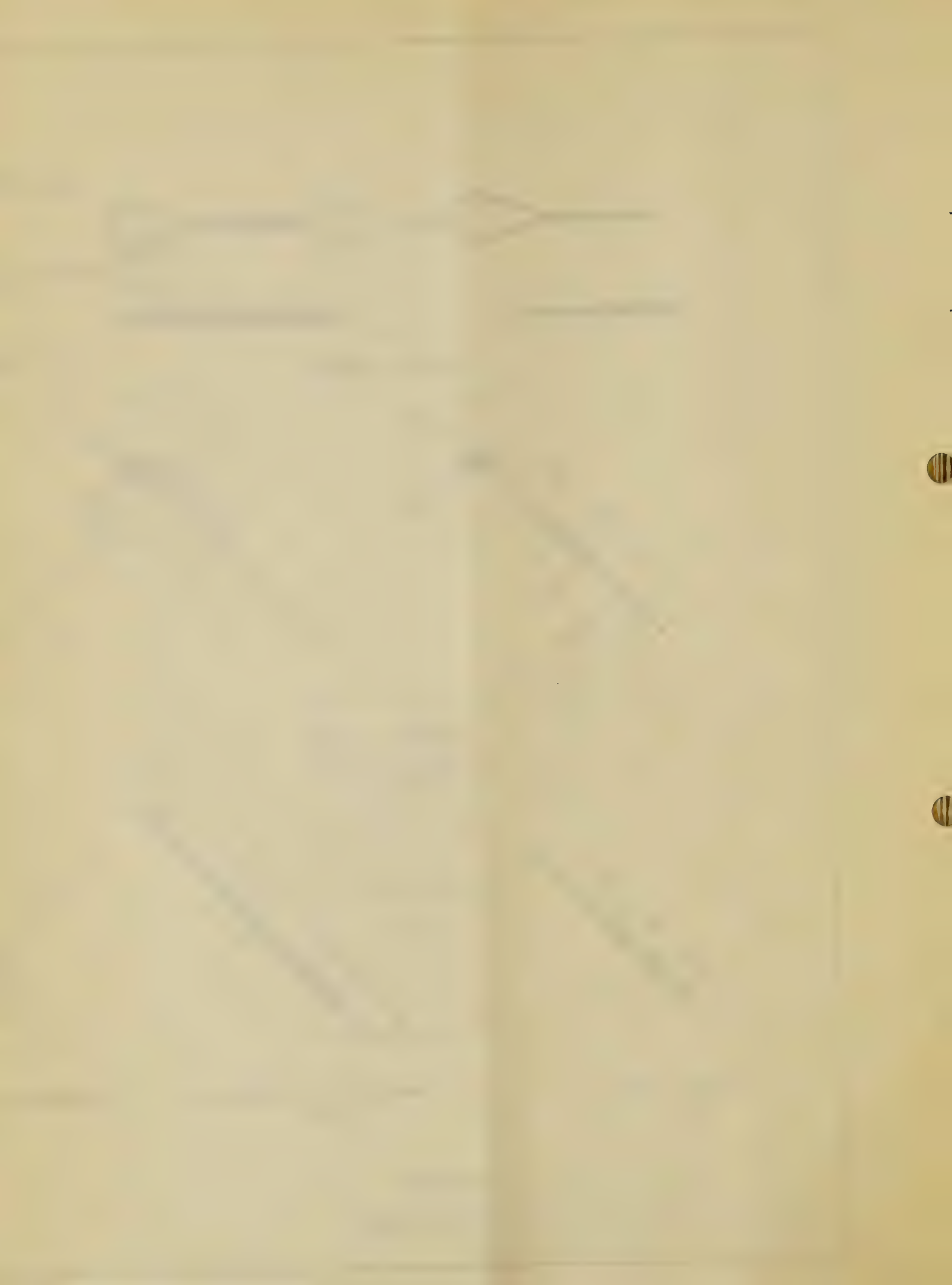
TRANSMISSION LINE DEAD END STRUCTURE

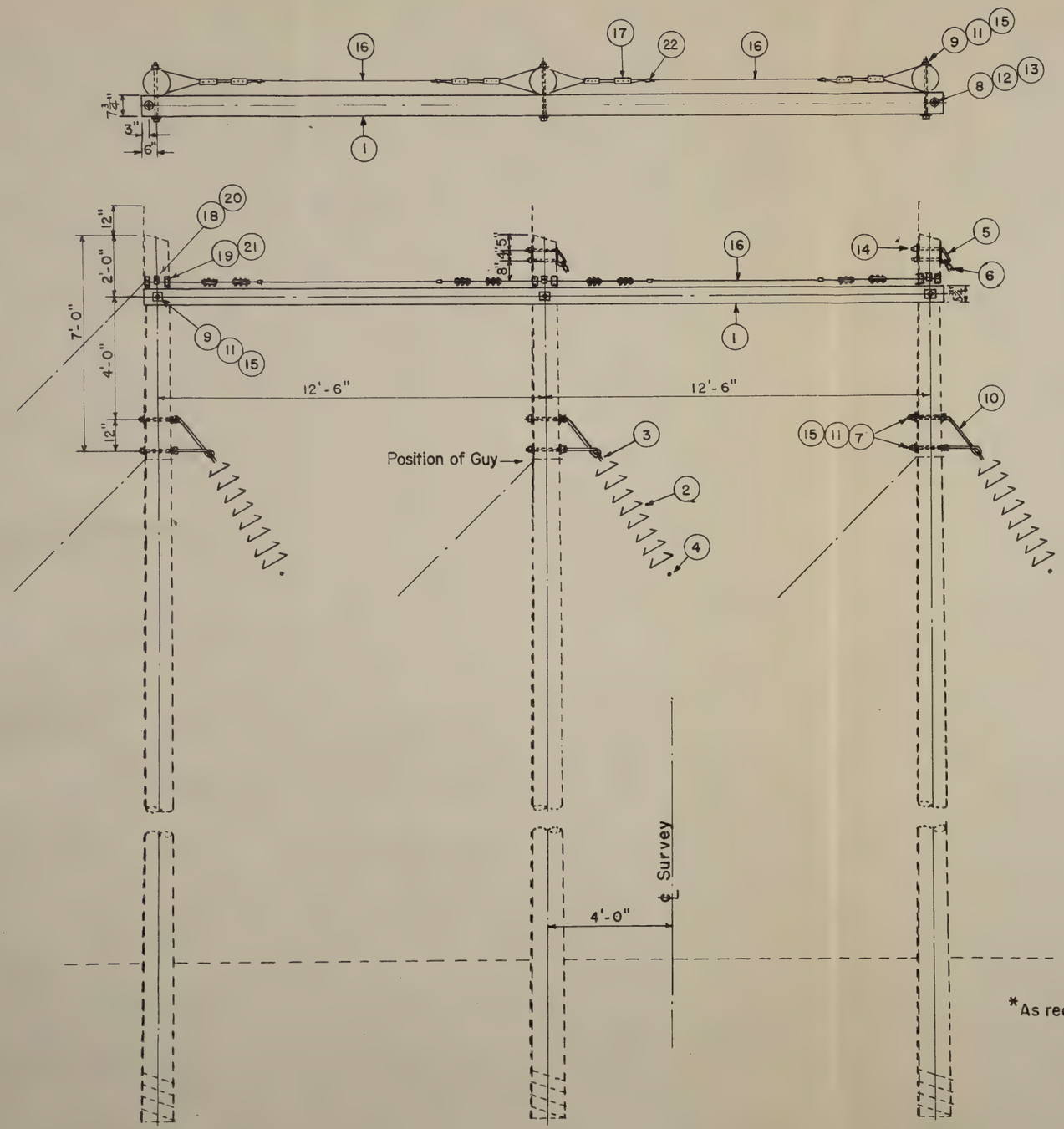
____ KV. TWO POLE DOUBLE DEAD END

(115 KV. MAXIMUM)

Scale: 1/4"=1'-0"		Date: 11-49
		TH-2A

946698 O—51 (Fold-in No. 21)





*As required. See Drg. TM-1

NOTE

Make one turn of downlead underneath washers around conductor support bolts and overhead ground wire support bolts.

LIST OF MATERIAL

DR'G REF.	REQ'D	DESCRIPTION	ITEM
1	1	5¾"x7¾"x 26'-0" Wood Crossarm	g
2	*	5 3/4"x 10" Suspension Insulator	k
3	3	Suspension Hook	eh
4	3	Suspension Clamp and Connecting Piece	ei
5	2	Ground Wire Cable Support	ed
6	2	Ground Wire Suspension Clamp	m
7	6	3/4"x 14" Clevis Bolt	ef
8	2	1/2"x 8" Machine Bolt	c
9	3	3/4"x 20" Machine Bolt	c
10	3	3/4" Angle Bracket	cr
11	18	4"x 4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
12	4	1 3/8" Galv. Round Washer, 9/16" Hole	d
13	2	Locknuts for 1/2" Bolt	ek
14	4	Locknuts for 5/8" Bolt	ek
15	9	Locknuts for 3/4" Bolt	ek
16	50'	Guy Wire	y
17	8	3 Bolt Guy Clamp - 6" Long	u
18	6	Guy Hook	bj
19	6	Guy Plate	bk
20	6	1/2"x 4" Lag Screw	j
21	3/16#	6d Copperweld Nails	bp
22	4	Guy Clip	dz

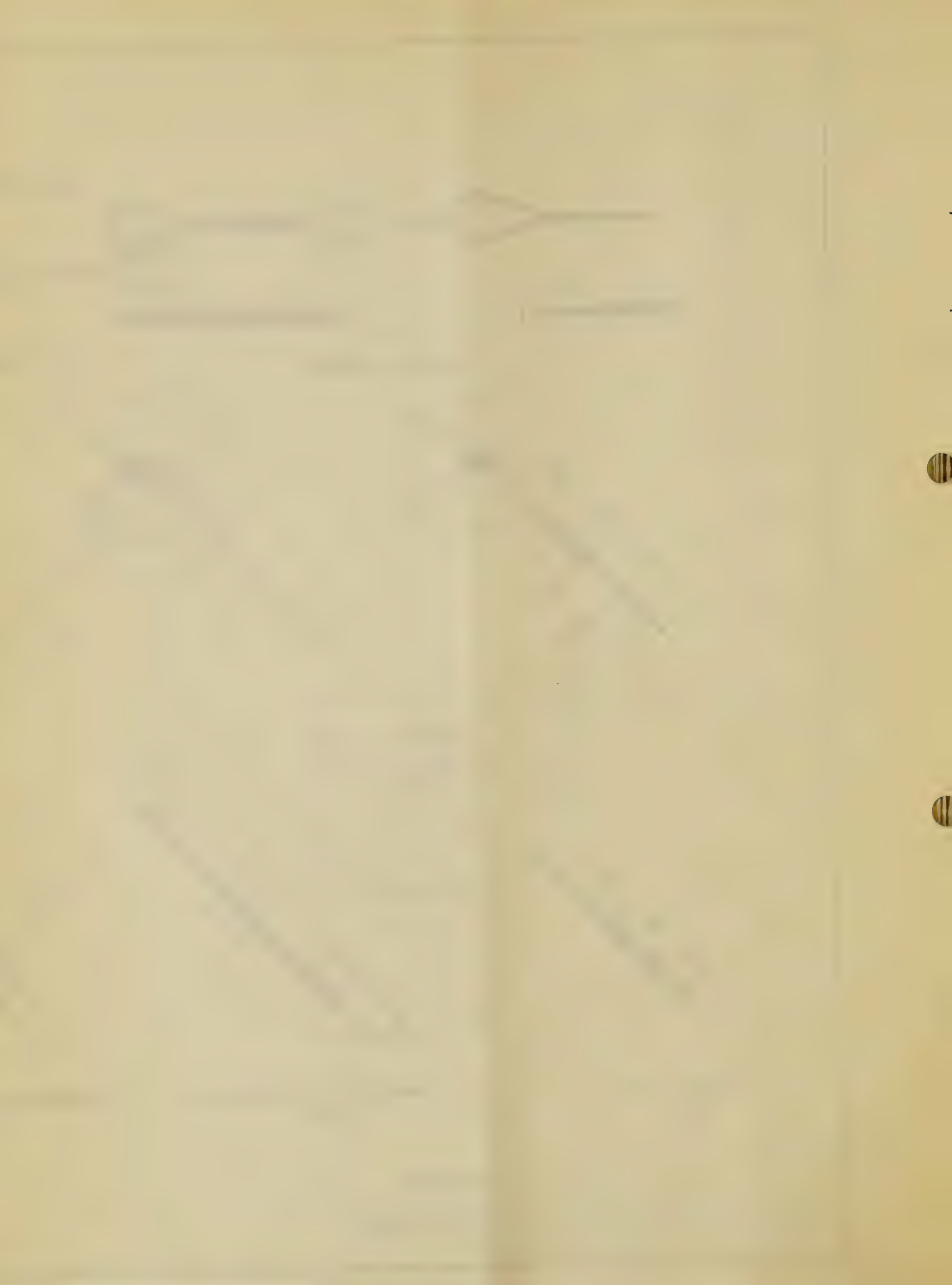
TRANSMISSION LINE MEDIUM ANGLE STRUCTURE

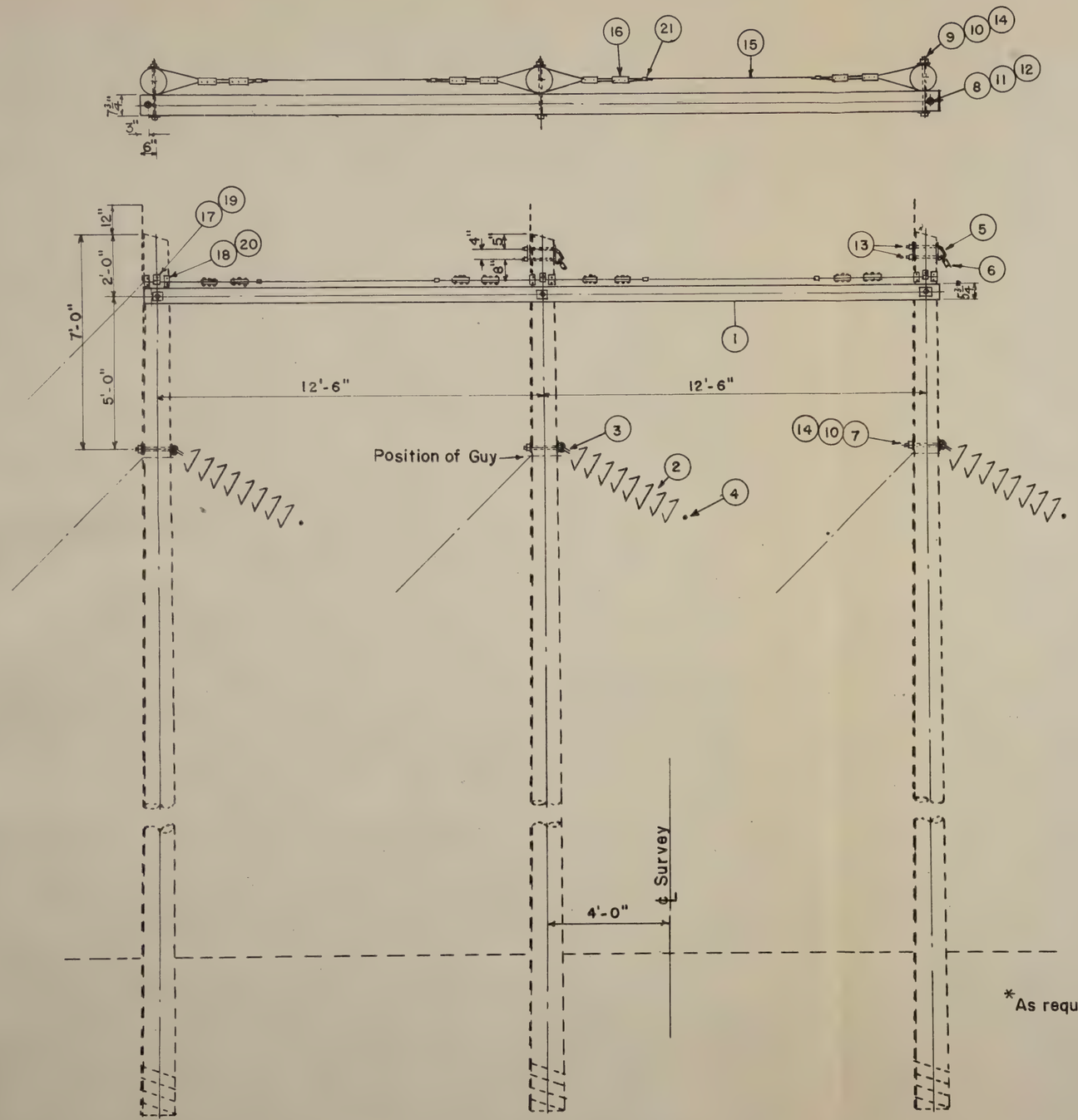
____KV. H-FRAME SUSPENSION- THREE POLE

115 KV. MAXIMUM - 12'-6" POLE SPACING

Scale: 1/4"=1'-0"		Date: 11-4-9
		TH-3A

946698 O—51 (Fold-in No. 22)





*As required. See Drg. TM-1

NOTE

Make one turn of downlead underneath washers around conductor support bolts and overhead ground wire support bolts.

LIST OF MATERIAL

DR'G REF.	REQ'D	DESCRIPTION	ITEM
1	1	5¾"x7¾"x 26'-0" Wood Crossarm	g
2	*	5 3/4"x 10" Suspension Insulator	k
3	3	Suspension Hook	eh
4	3	Suspension Clamp and Connecting Piece	ei
5	2	Ground Wire Cable Support	ed
6	2	Ground Wire Suspension Clamp	m
7	3	3/4"x 14" Eye Bolt	o
8	2	1/2"x 8" Machine Bolt	c
9	3	3/4"x 20" Machine Bolt	c
10	12	4"x 4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
11	4	1 3/8" Galv. Round Washer, 9/16" Hole	d
12	2	Locknuts for 1/2" Bolt	ek
13	4	Locknuts for 5/8" Bolt	ek
14	6	Locknuts for 3/4" Bolt	ek
15	46'	Guy Wire	y
16	8	3 Bolt Guy Clamp-6" Long	u
17	6	Guy Hook	bj
18	6	Guy Plate	bk
19	6	1/2"x 4" Lag Screw	j
20	3/16#	6 d Copperweld Nails	bp
21	4	Guy Clip	dz

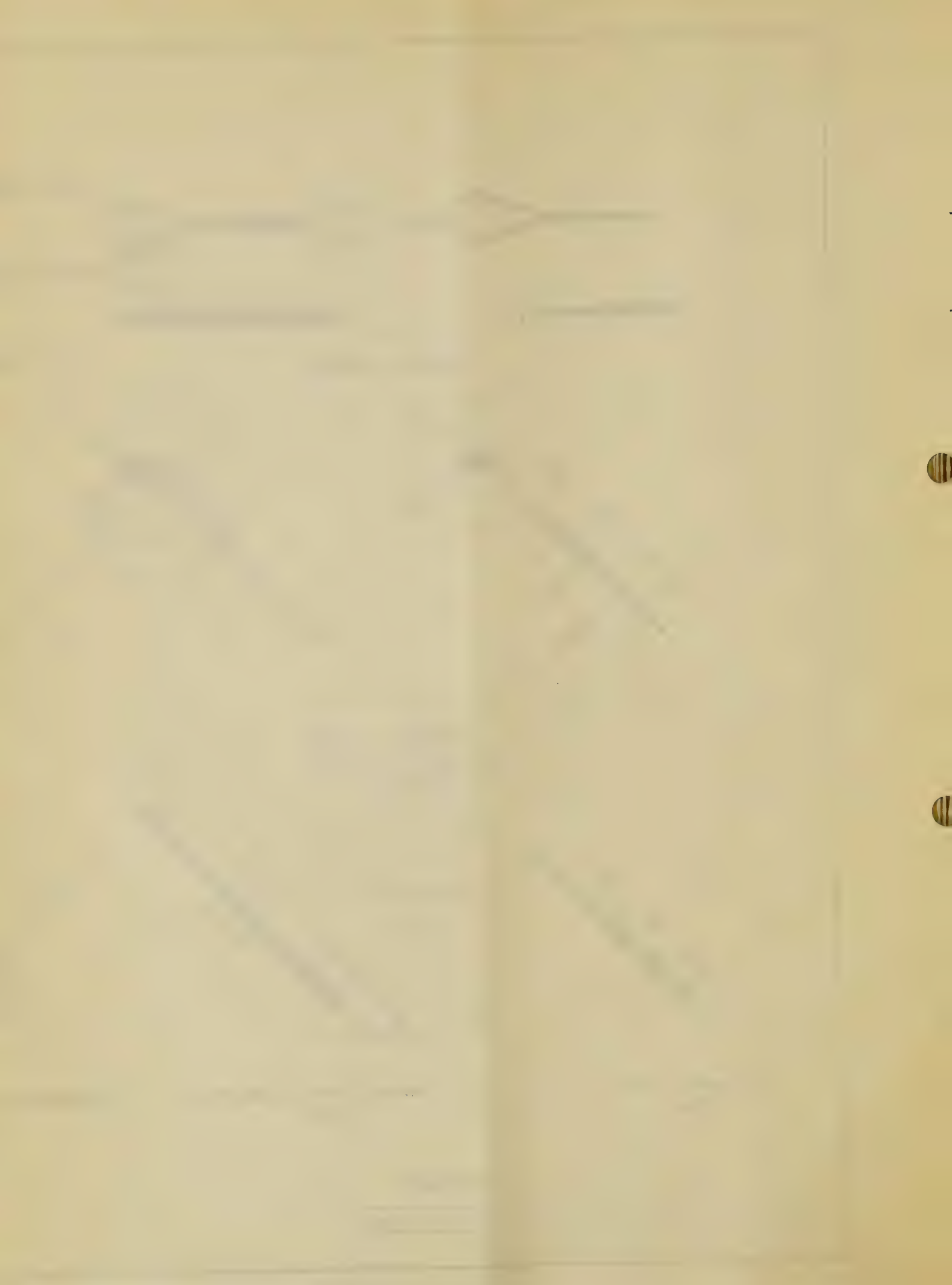
TRANSMISSION LINE LARGE ANGLE STRUCTURE

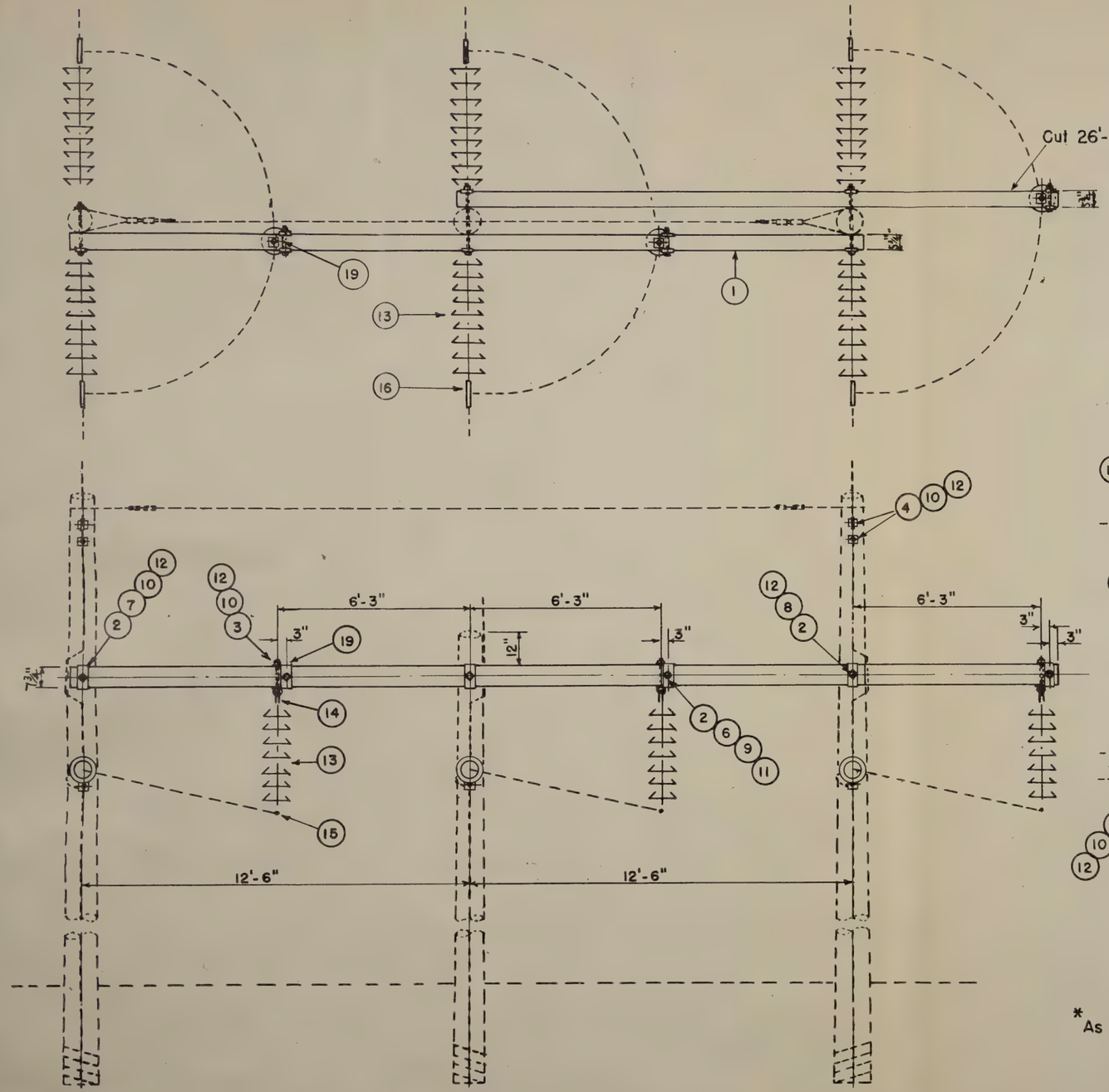
___ KV. H-FRAME SUSPENSION-THREE POLE

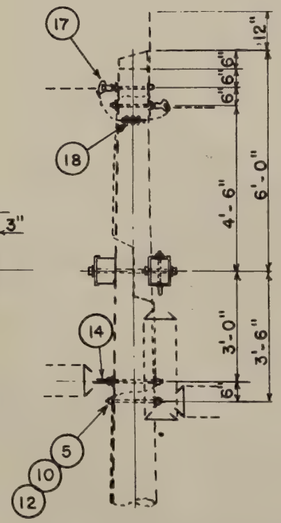
115 KV. MAXIMUM - 12'-6" POLE SPACING

Scale: 1/4"=1'-0"		Date: 11-49
		TH-4A

946698 O—51 (Fold-in No. 23)







*As required. See Drg. TM-1

LIST OF MATERIAL			
DR'G REF.	REQ'D	DESCRIPTION	ITEM
1	2	5¾"x7¾"x 26'-0" Wood Crossarm	g
2	11	Reinforcing Plate for 8" Crossarm	eg
3	3	3/4"x 10" Eye Bolt	o
4	4	3/4"x 12" Eye Bolt	o
5	6	3/4"x 14" Eye Bolt	o
6	3	1/2"x 8" Machine Bolt	c
7	1	3/4"x 20" Machine Bolt	c
8	2	3/4"x 26" Machine Bolt	c
9	6	1 3/8" Galv. Round Washer, 9/16" Hole	d
10	27	4"x 4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
11	3	Locknuts for 1/2" Bolt	ek
12	16	Locknuts for 3/4" Bolt	ek
13	*	5 3/4"x 10" Suspension Insulator	k
14	9	Suspension Hook	eh
15	3	Suspension Clamp and Connecting Piece	ei
16	6	Conductor Dead End Clamp and Connecting Piece	ej
17	4	Ground Wire Dead End Clamp	l
18	2	3 Bolt Clamp-6" Long	u
19	3	3"x 8"x 30 Ga. Copper Strip	

NOTE

Make one turn of downlead underneath washers around conductor support bolts and overhead ground wire support bolts, and staple to pole so that it does not come in contact with crossarms or through bolts.

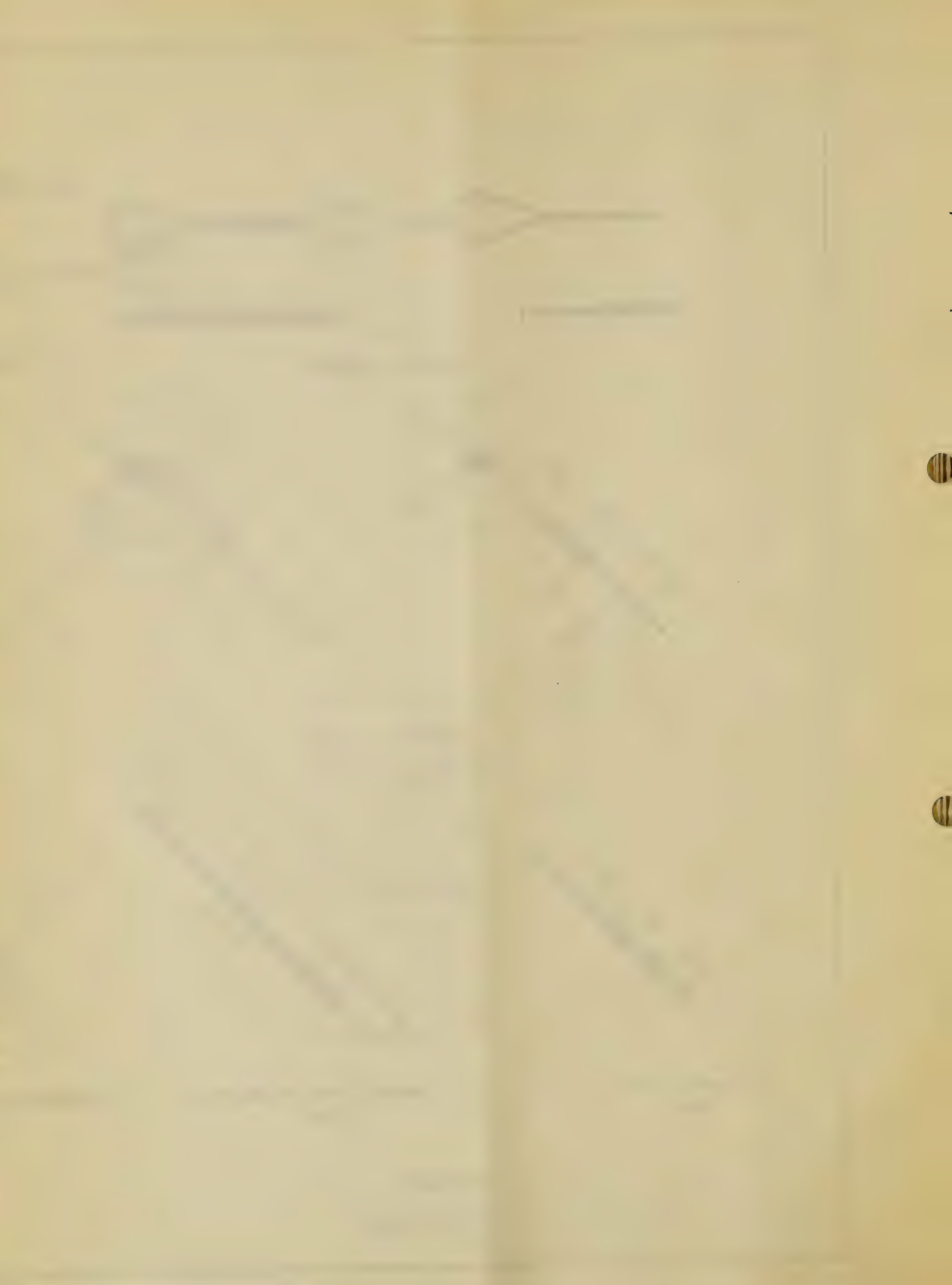
TRANSMISSION LINE DEAD END STRUCTURE

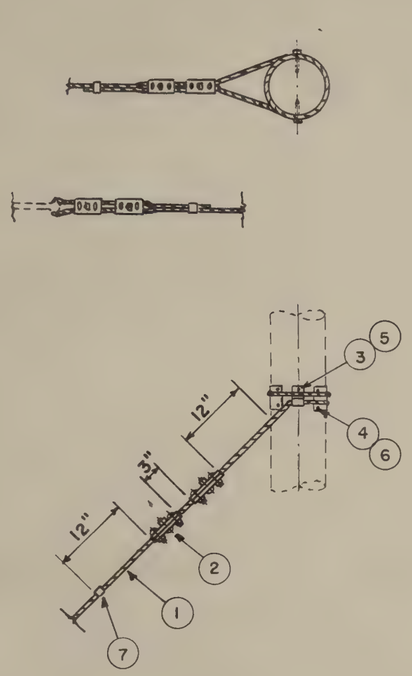
___ KV. THREE POLE DOUBLE DEAD END

115 KV. MAXIMUM - 12'-6" POLE SPACING

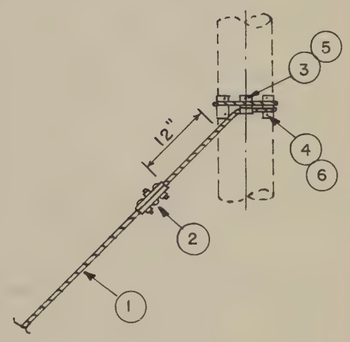
Scale: 1/4"=1'-0"		Date: 11-49
		TH-5A

946698 O—11 (Fold-in No. 24).

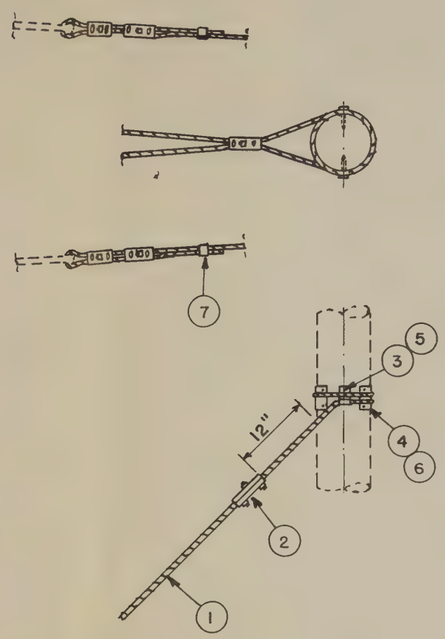




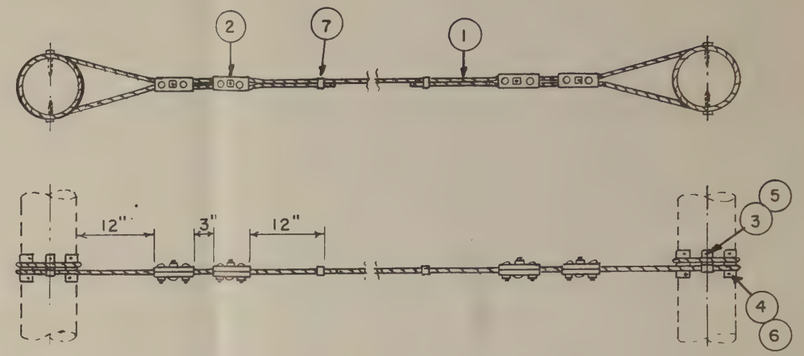
SINGLE GUY
TG-1



DOUBLE GUY TO ONE ROD
TG-2



DOUBLE GUY TO TWO RODS
TG-3



OVERHEAD GUY
TG-4

LIST OF MATERIAL

DR'G REF.	REQUIRED TG-1	TG-2	TG-3	TG-4	DESCRIPTION	ITEM
1	75'±	150'±	150'±	25'±	Guy Wire	y
2	4	5	5	4	3 Bolt Guy Clamp, 6" Long	u
3	2	2	2	4	Guy Hook	bj
4	2	2	2	4	Guy Plate	bk
5	2	2	2	4	1/2"x 4" Lag Screw	j
6	1/16#	1/16#	1/16#	1/8#	6 d Copperweld Nails	bp
7	2	2	2	2	Guy Clip	dz

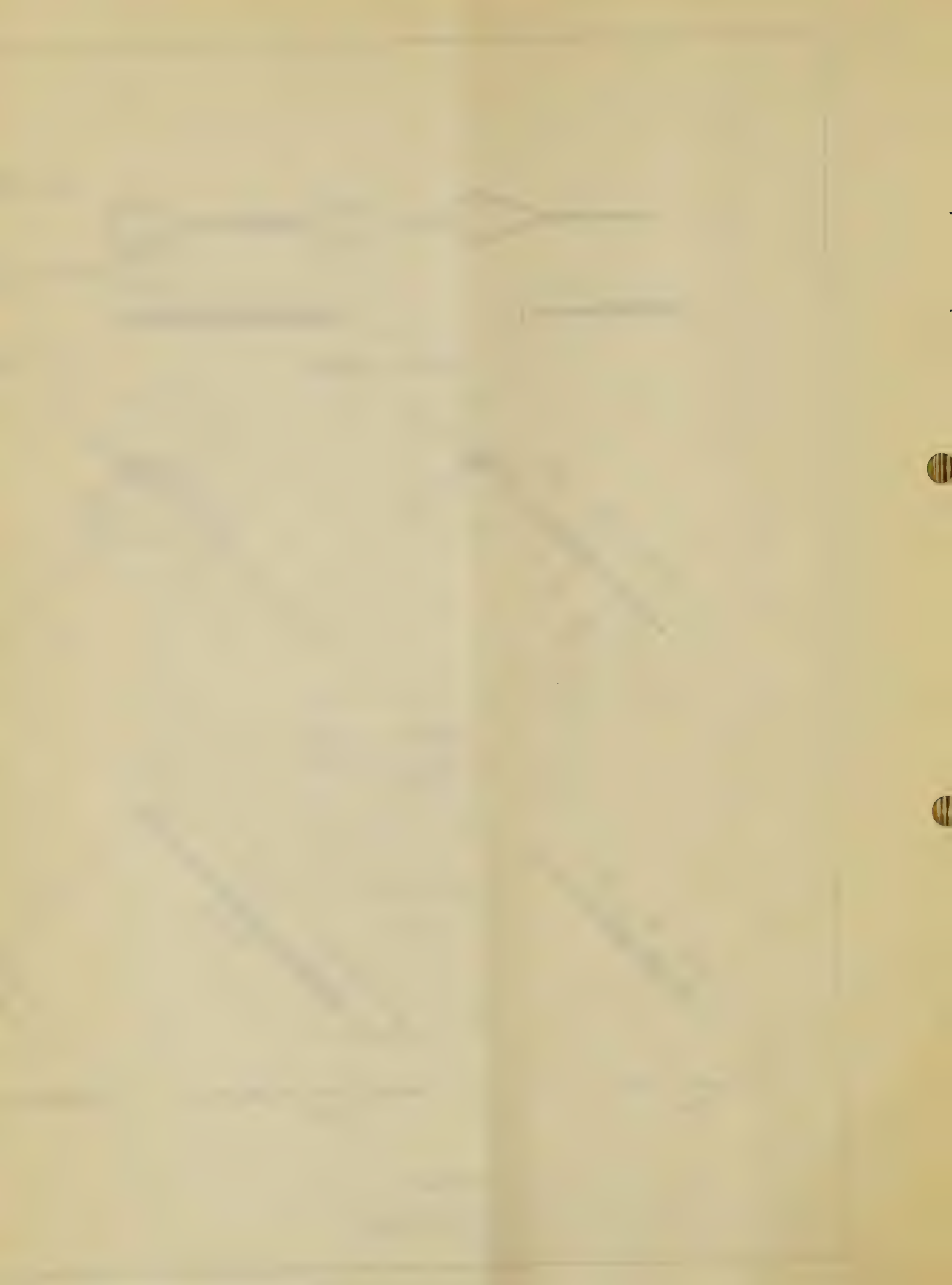
TRANSMISSION LINE GUY ASSEMBLIES

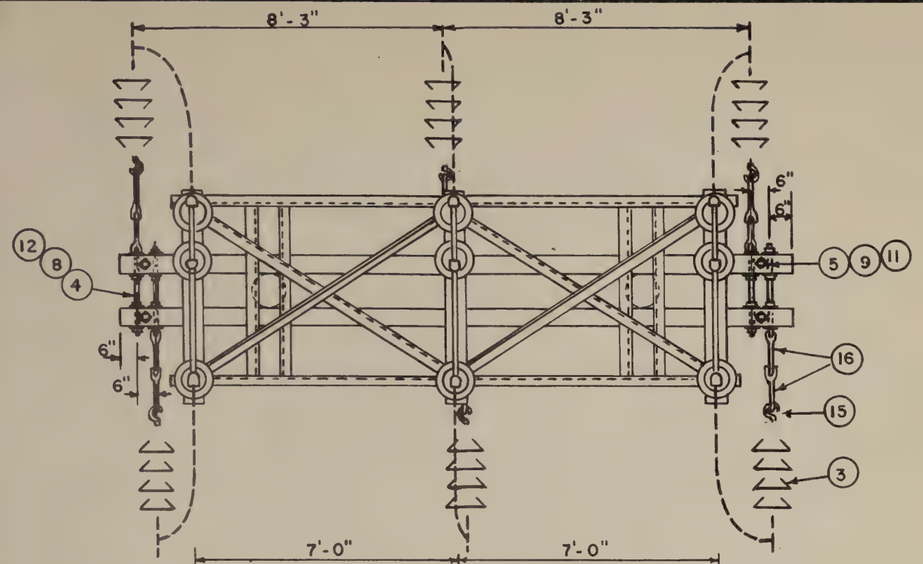
Scale: 1/2"=1'-0"

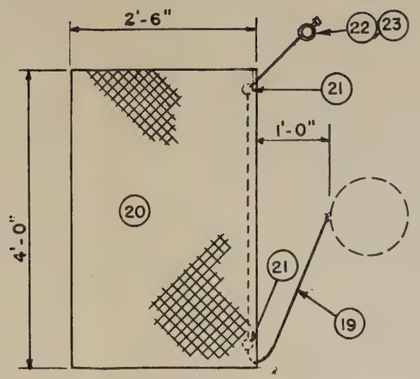
Date:

TG-1,2,3,4

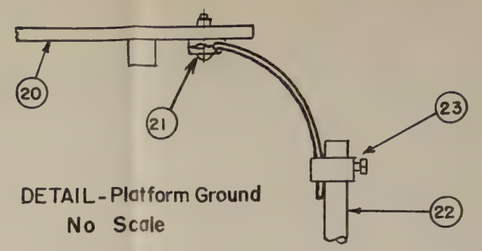
946698 O—51 (Fold-in No. 25)



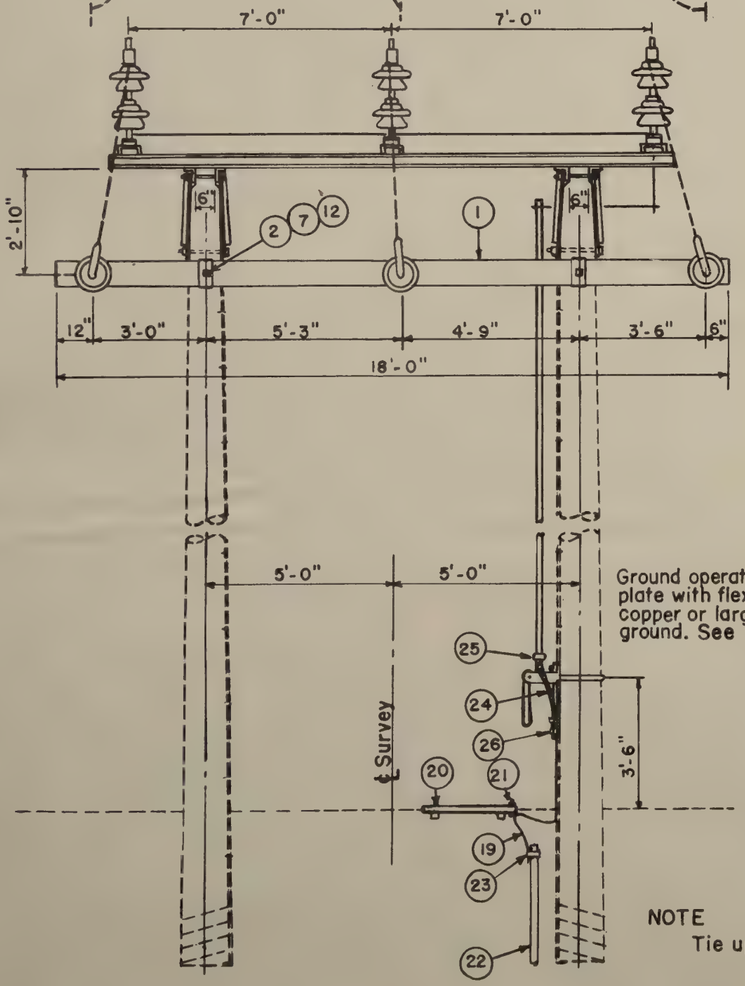


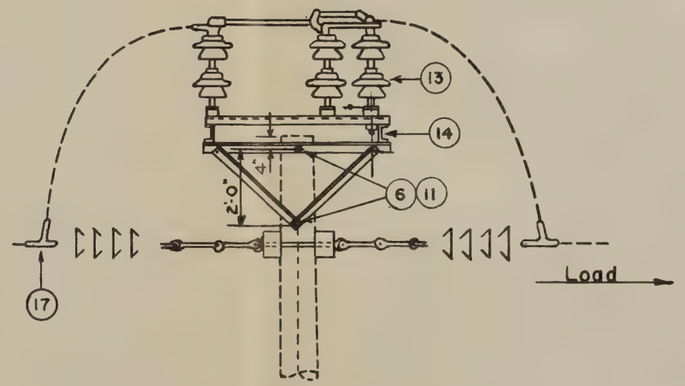


DETAIL - Platform
Scale: 1/2"=1'-0"

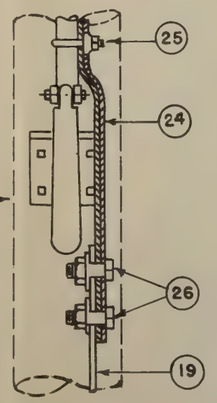


DETAIL - Platform Ground
No Scale





Ground operating rod to platform plate with flexible braid to No. 1 copper or larger stapled to pole ground. See detail.



* As required. See Drg. TM-1

NOTE
Tie upper end of downlead solidly to switch frame.

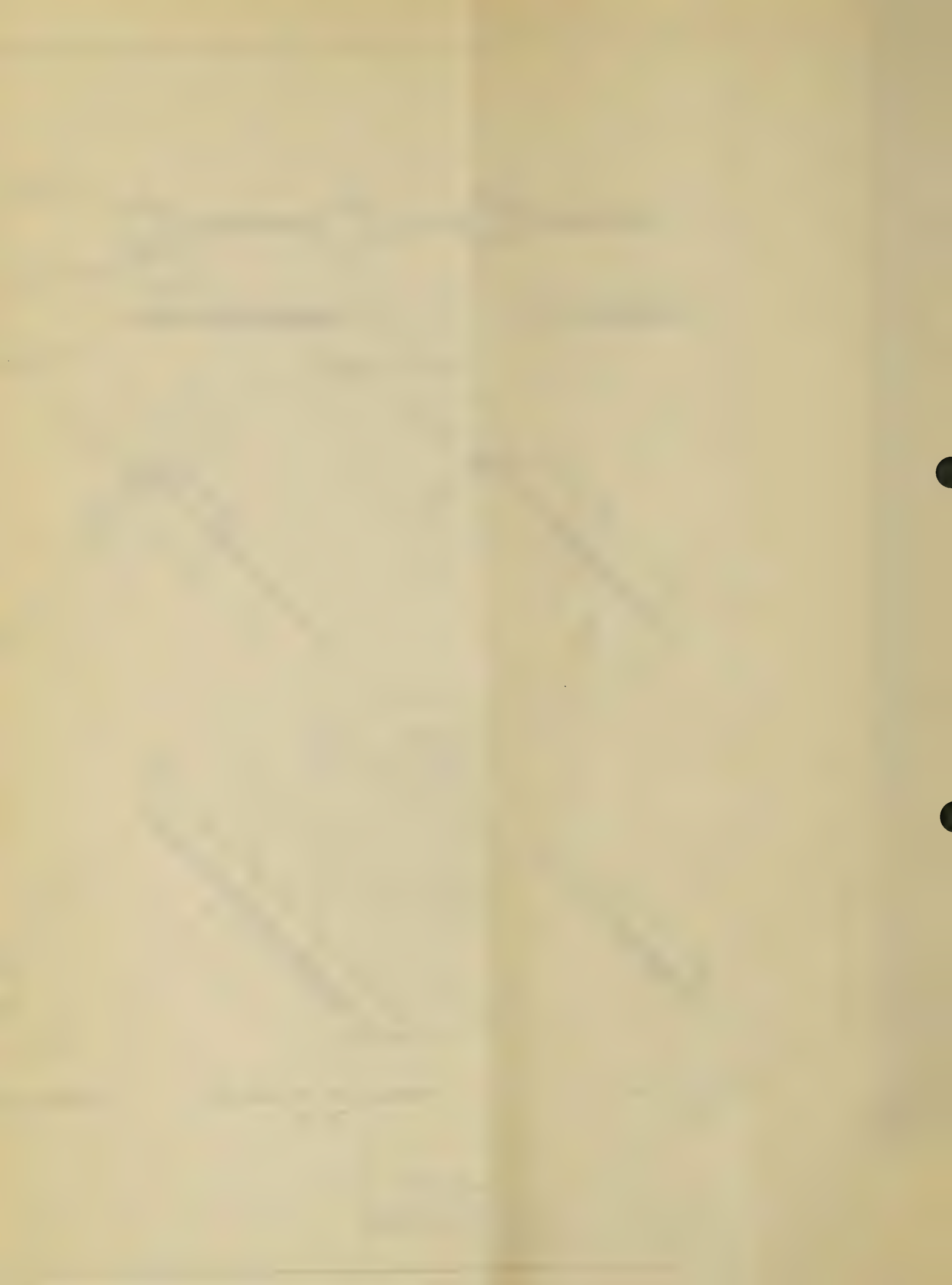
LIST OF MATERIAL

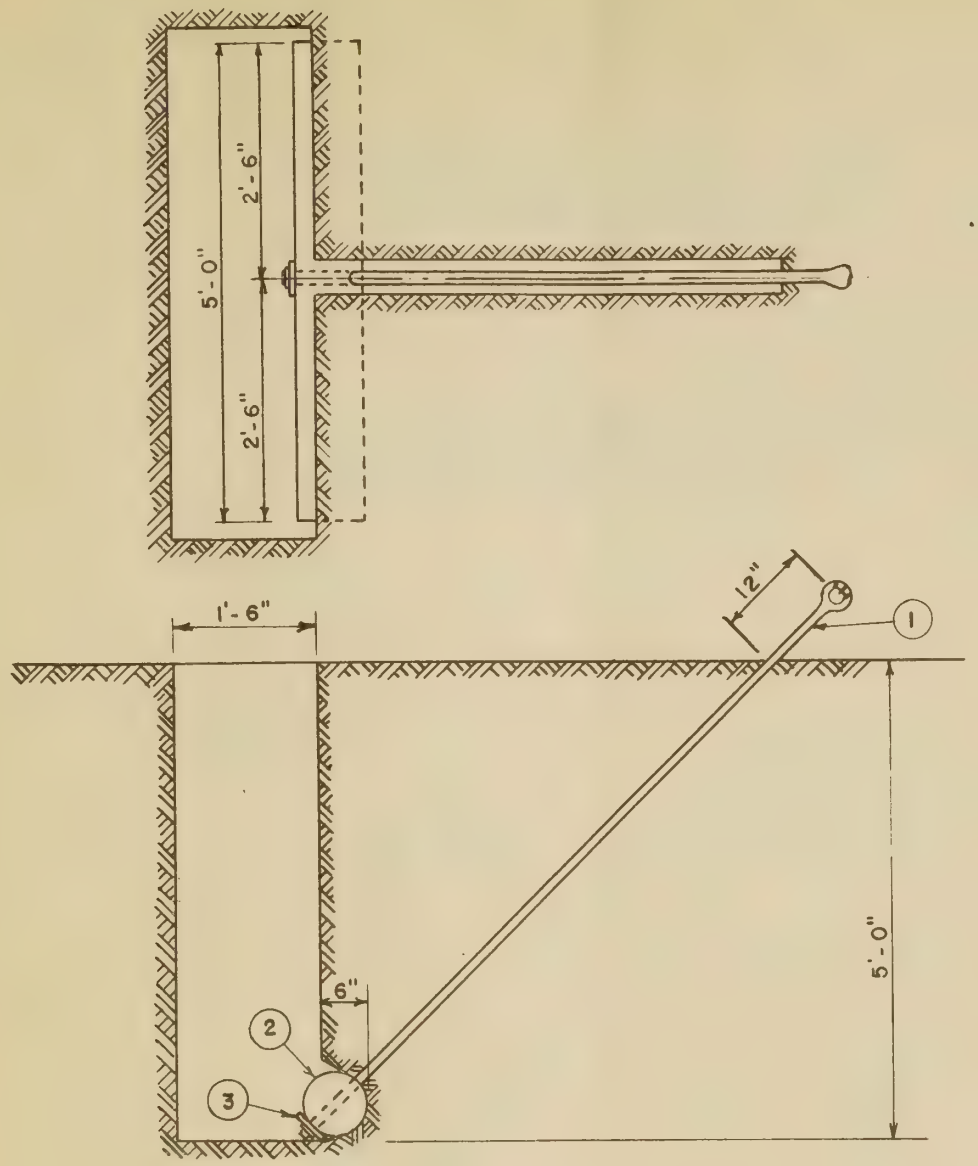
DRG. REF.	REQ'D	DESCRIPTION	ITEM
1	2	5¾"x7¼" x 18'-0" Wood Crossarm	g
2	4	Reinforcing Plate for 8" Crossarm	eg
3	*	5 3/4"x 10" Suspension Insulator	k
4	6	3/4" x 26" Double Arm Eye Bolt	dy
5	6	5/8" x 10" Machine Bolt	c
6	4	5/8"x12" Machine Bolt	c
7	2	3/4"x 26" Machine Bolt	c
8	24	4"x4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
9	12	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
10			
11	10	Locknuts for 5/8" Bolt	ek
12	8	Locknuts for 3/4" Bolt	ek
13	1	3 Phase, Group Operated Switch and Control Assembly	cg
14	1	Steel Support Assembly for Switch	
15	6	Suspension Hook	eh
16	12	Extension Link	du
17	6	Dead End Clamp and Connecting Piece	ej
18			
19	15'	No. 1 Solid Copper Wire	cj
20	1	Grounded Iron Platform Plate	
21	2	Grounding Connector - Single Groove	dp
22	1	5/8"x 8'-0" Ground Rod	aj
23	1	Ground Rod Clamp	ai
24	1	Flexible Braided Strap (Furnished with switch)	
25	1	Flexible Strap Clamp (Furnished with switch)	
26	2	Split Bolt Connector	p

TRANSMISSION LINE SECTIONALIZING STRUCTURE
_____ KV. AIR BREAK SWITCH
(69 KV. MAXIMUM)

Scale: 1/4"=1'-0"		Date: 11-49
		TM-3

946698 O—51 (Fold-in No. 26)



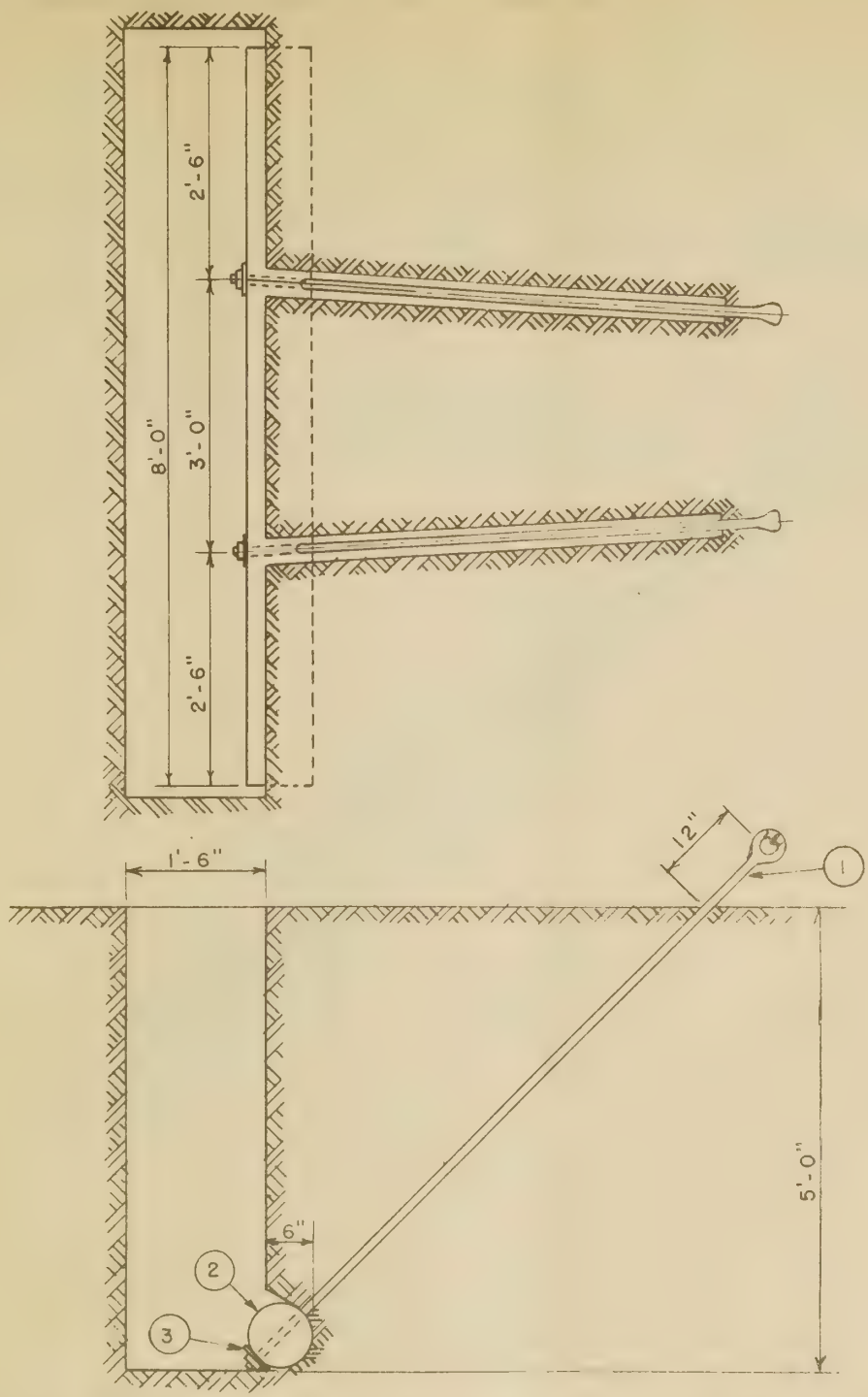


DR'G REF.	REQ'D	DESCRIPTION	ITEM	MAXIMUM WORKING LOADS
1	1	3/4"x 8'-0" Twin Eye Anchor Rod	x	8,000#
2	1	8"x 5'-0" Anchor Log	z	8,000#
3	1	4"x 4"x 1/2" Galv. Sq. Washer, 13/16" Hole	d	

TRANSMISSION LINE

SINGLE ROD LOG ANCHOR ASSEMBLY

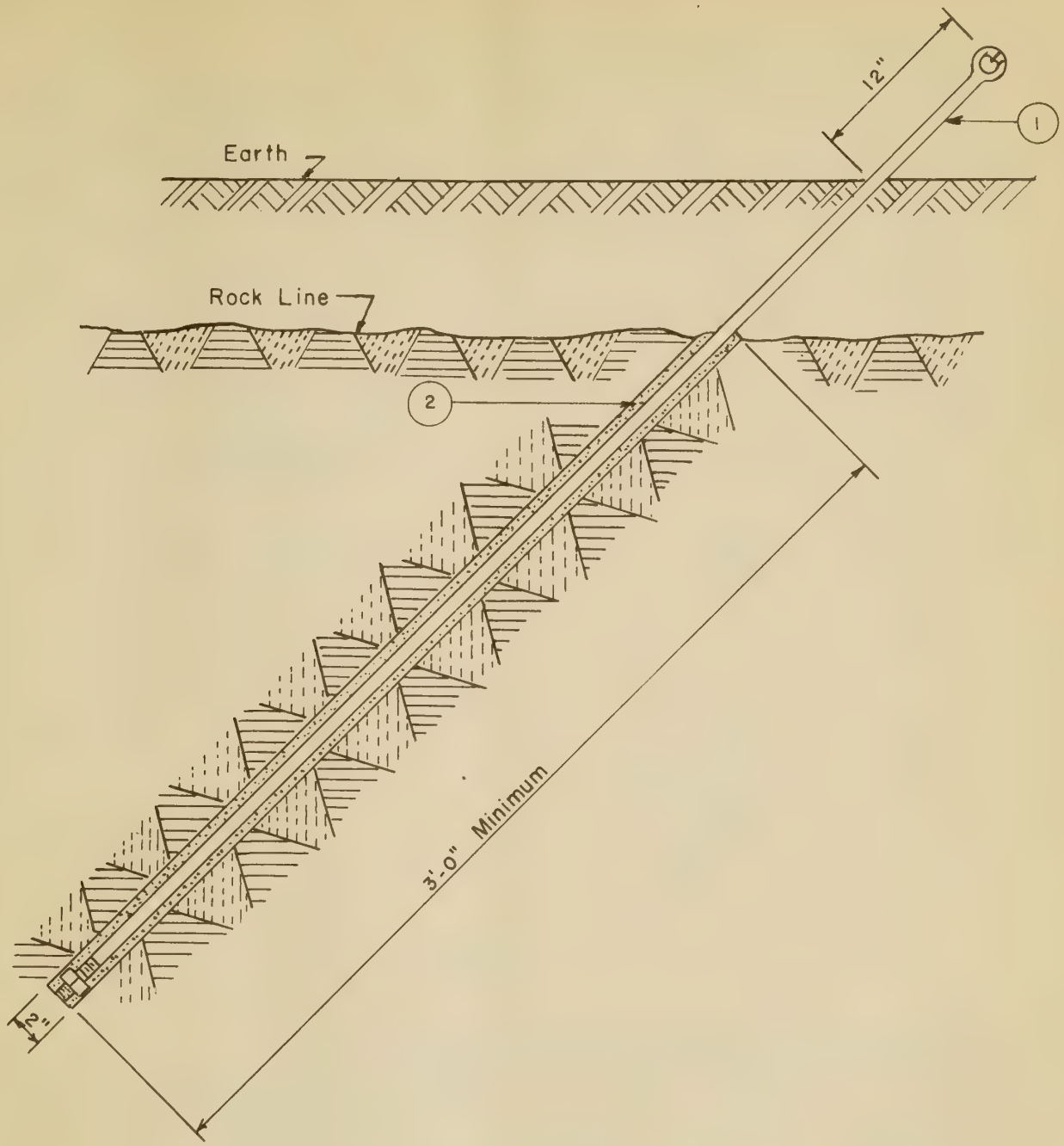
Scale: 1/2"=1'-0"		Date:
		TA-1-5



DR'G REF.	REQ'D	DESCRIPTION	ITEM	MAXIMUM WORKING LOADS
1	2	3/4"x8'-0" Twin Eye Anchor Rod	x	8,000 #
2	1	8"x8'-0" Anchor Log	z	16,000 #
3	2	4"x4"x1/2" Galv. Sq. Washer, 13/16" Hole	d	

TRANSMISSION LINE
TWO ROD LOG ANCHOR ASSEMBLY

Scale: 1/2"=1'-0"		Date:
		TA-1-8



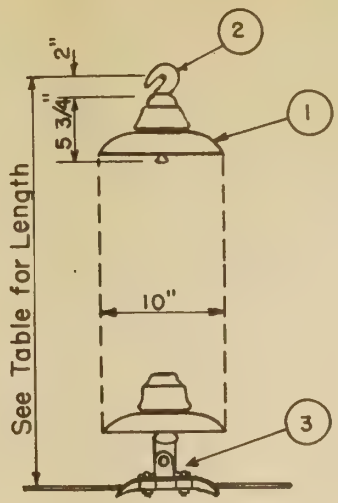
DR'G REF.	REQ'D	DESCRIPTION	ITEM	MAXIMUM WORKING LOAD
1	1	3/4"x 8'-0" Twin Eye Anchor Rod	x	8000 #
2		Grout		

TRANSMISSION LINE
ROCK ANCHOR ASSEMBLY

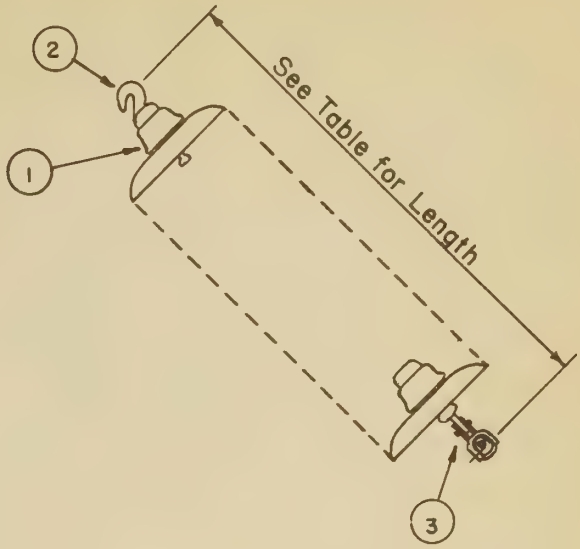
Scale: 1"=1'-0"

Date:

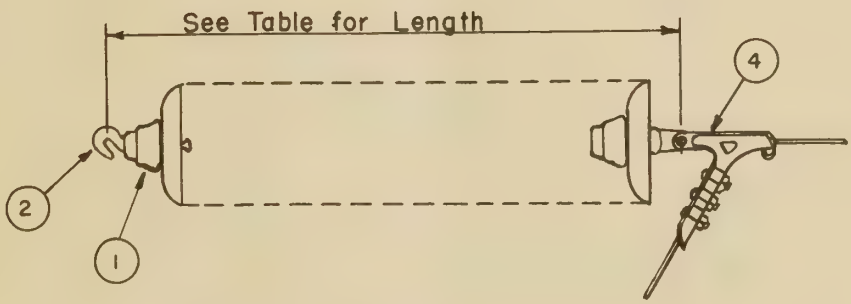
TA-2



TANGENT ASSEMBLY



ANGLE ASSEMBLY



DEAD END ASSEMBLY

NOTE:

Suitable conductor clamps must be selected for the conductor being used. The exact length of suspension and angle strings will depend on the clamp used.

* Tangent String

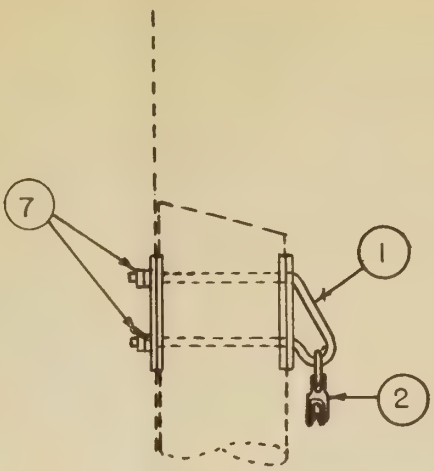
VOLTAGE CLASS	TANGENT		ANGLE		DEAD END		IMPULSE VALUE	
	UNITS	LENGTH	UNITS	LENGTH	UNITS	LENGTH		
34.5 KV.			3	2'-0" ±	4	2'-3" ±	.	
46 KV.	3	2'-0" ±	4	2'-6" ±	5	2'-9" ±	345 *	
69 KV.	4	2'-6" ±	5	3'-0" ±	6	3'-2" ±	415 *	
115 KV.	7	3'-11" ±	8	4'-5" ±	9	4'-8" ±	670 *	

LIST OF MATERIAL

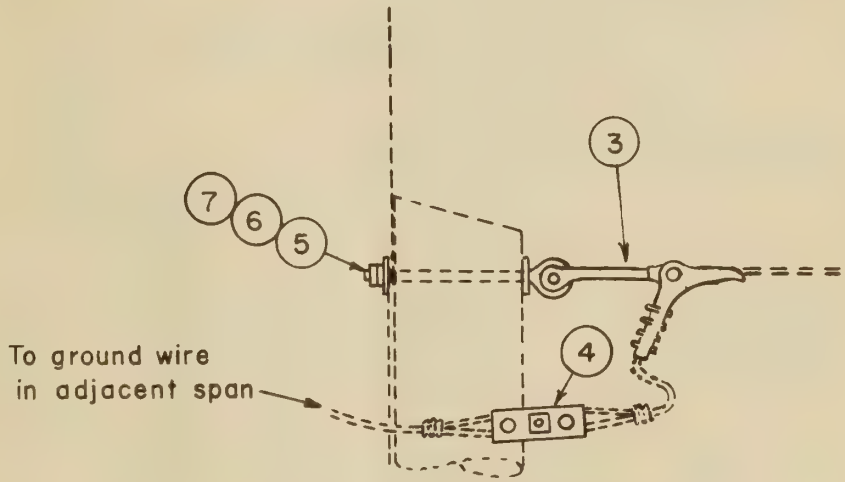
DRG. REF.	REQ'D	DESCRIPTION	ITEM
1		5 3/4" x 10" Suspension Insulator	k
2	1	Suspension Hook	eh
3	1	Suspension Clamp & Connecting Piece	m
4	1	Dead End Clamp & Connecting Piece	l

GUIDE TO INSULATOR STRING ASSEMBLIES

Scale: 3/4"=1'-0"		Date:
		TM-1



SUSPENSION ASSEMBLY
TM-2



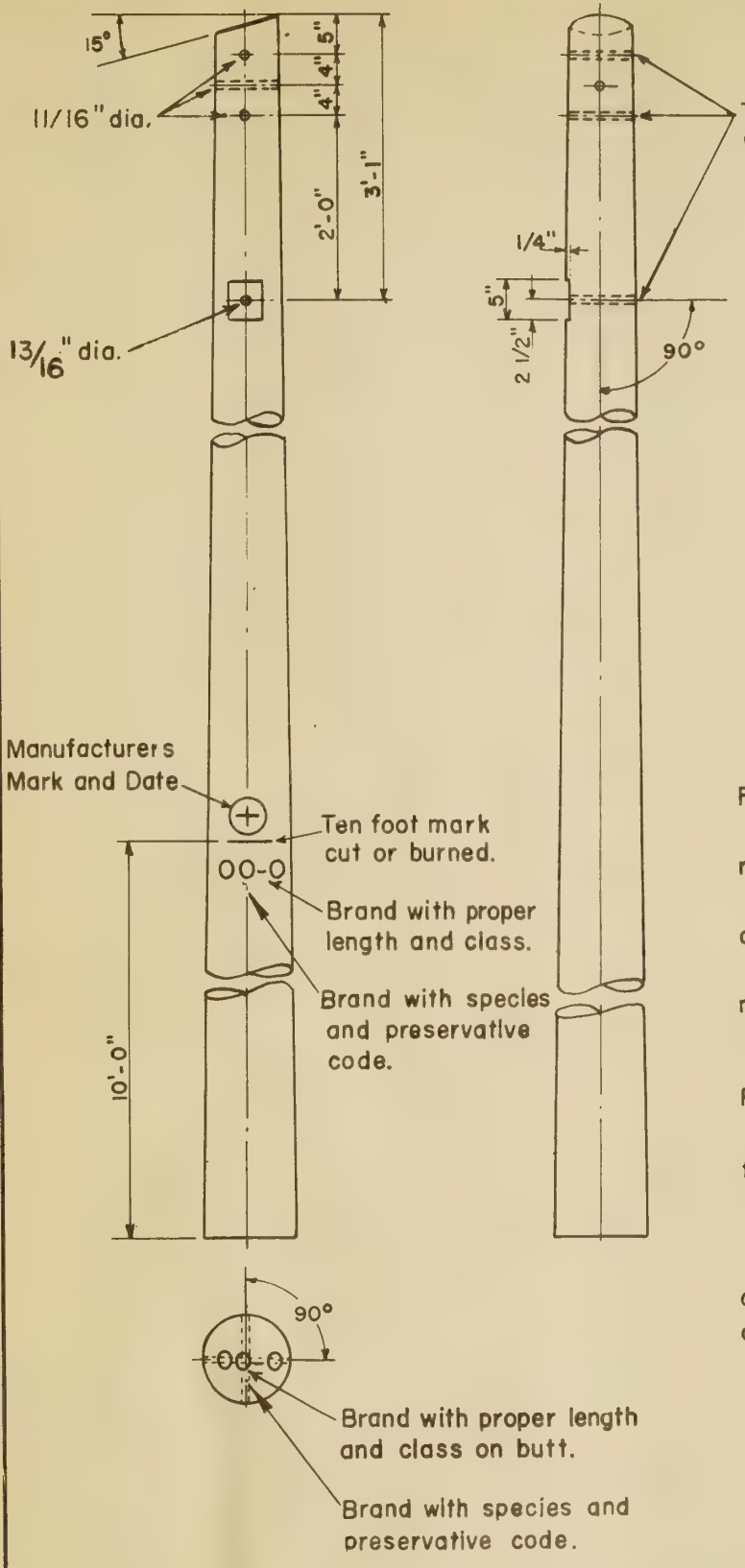
DEAD END ASSEMBLY
TM-2A

LIST OF MATERIAL

DR'G REF.	REQUIRED TM-2	REQUIRED TM-2A	DESCRIPTION	ITEM
1	1		Overhead Ground Wire Cable Support	ed
2	1		Ground Wire Suspension Clamp	m
3		1	Ground Wire Dead End Clamp	l
4		1	6" 3-Bolt Clamp	u
5		1	5/8"x 14" Eye Bolt	o
6		2	2 1/4"x 2 1/4"x 3/16" Galv. Sq. Washer, 13/16" Hole	d
7	2	1	Locknuts for 5/8" Bolt	ek

GUIDE TO OVERHEAD GROUND WIRE ASSEMBLIES

Scale: 1"=1'-0"		Date: 11-49
		TM-2, 2A



FRAMING

All poles treated full length must be bored, roofed, and gained before treatment.

Gains are to be flat with plane at right angles to bolt hole.

For field gains on full length treated poles metal gains are preferred.

FLAT ROOF

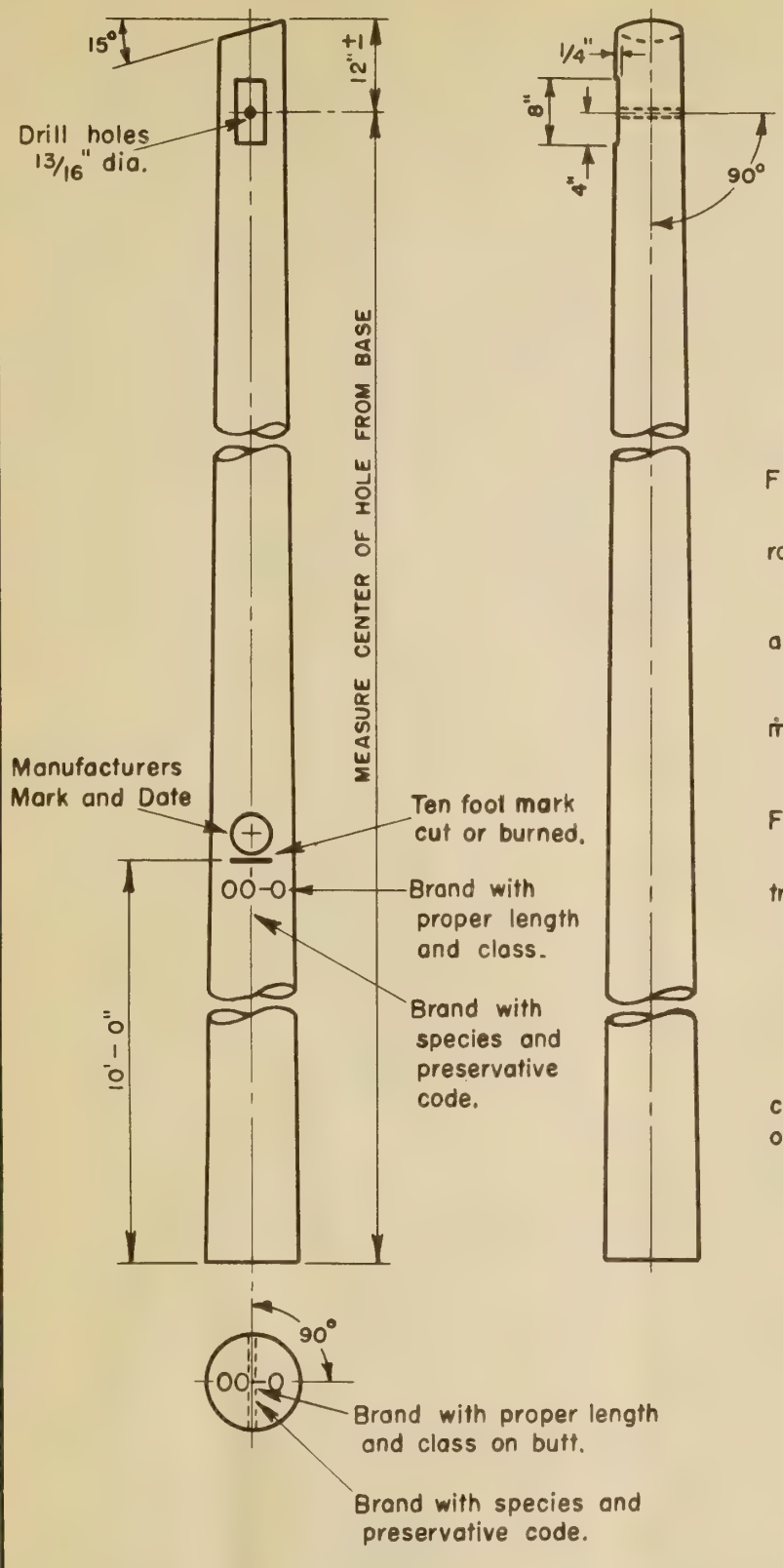
Flat roofs may be cut on all full-length treated poles before treatment.

When metal disk is used for branding, center of disk must be ten feet from butt of pole.

TRANSMISSION LINE POLE FRAMING FOR STRUCTURE TP-1

Scale: 1/2"=1'-0"		Date: 11-49
		TM-4

946698 O—51——6



FRAMING

All poles treated full length must be bored, roofed, and gained before treatment.

Gains are to be flat with plane at right angles to bolt holes.

For field gains on full length treated poles metal gains are preferred.

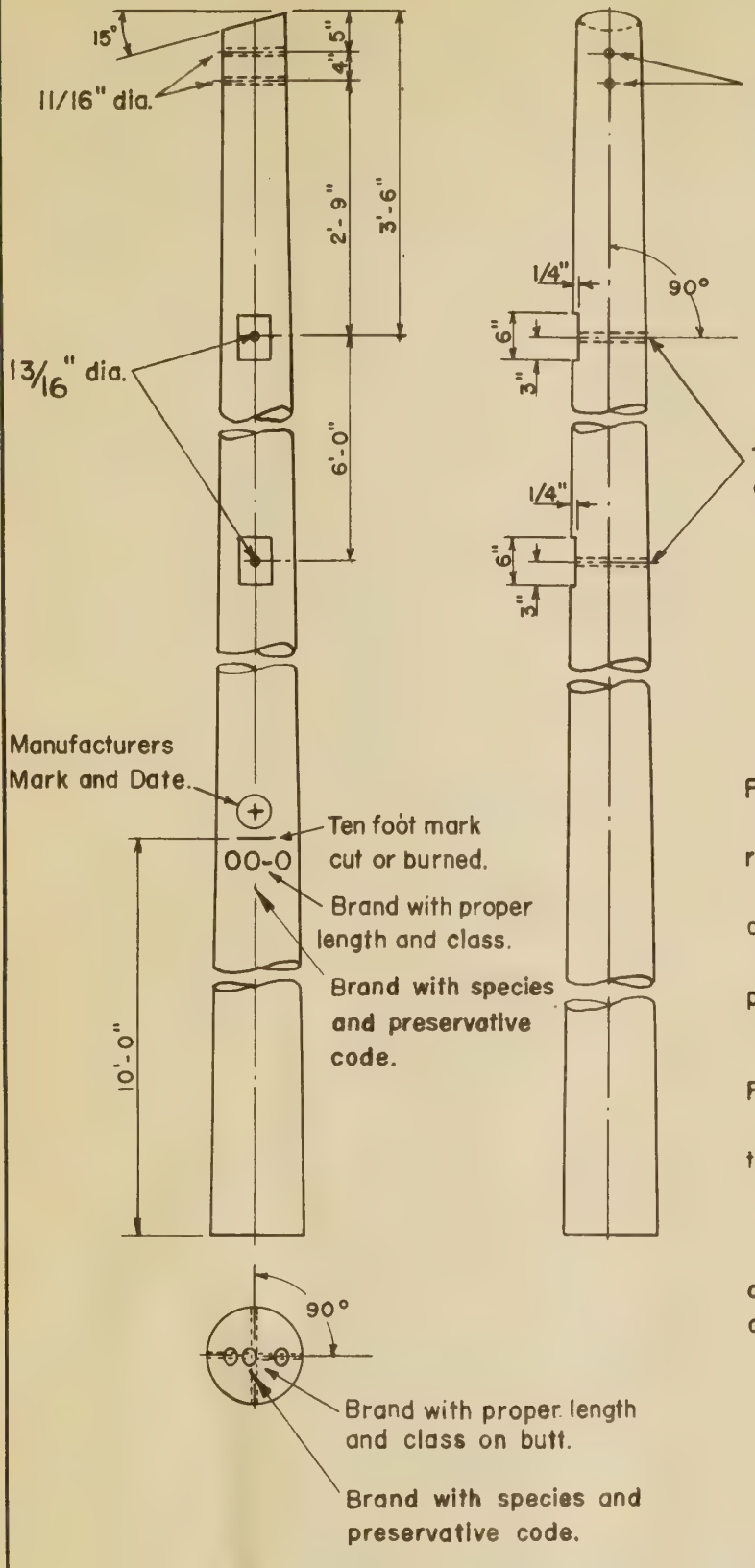
FLAT ROOF

Flat roofs may be cut on all full-length treated poles before treatment.

When metal disk is used for branding, center of disk must be ten feet from butt of pole.

TRANSMISSION LINE POLE FRAMING
FOR STRUCTURE TH-1

Scale: 1/2"=1'-0"		Date: 11-49
		TM-4A



FRAMING

All poles treated full length must be bored, roofed, and gained before treatment.

Gains are to be flat with plane at right angles to bolt hole.

For field gains on full length treated poles metal gains are preferred.

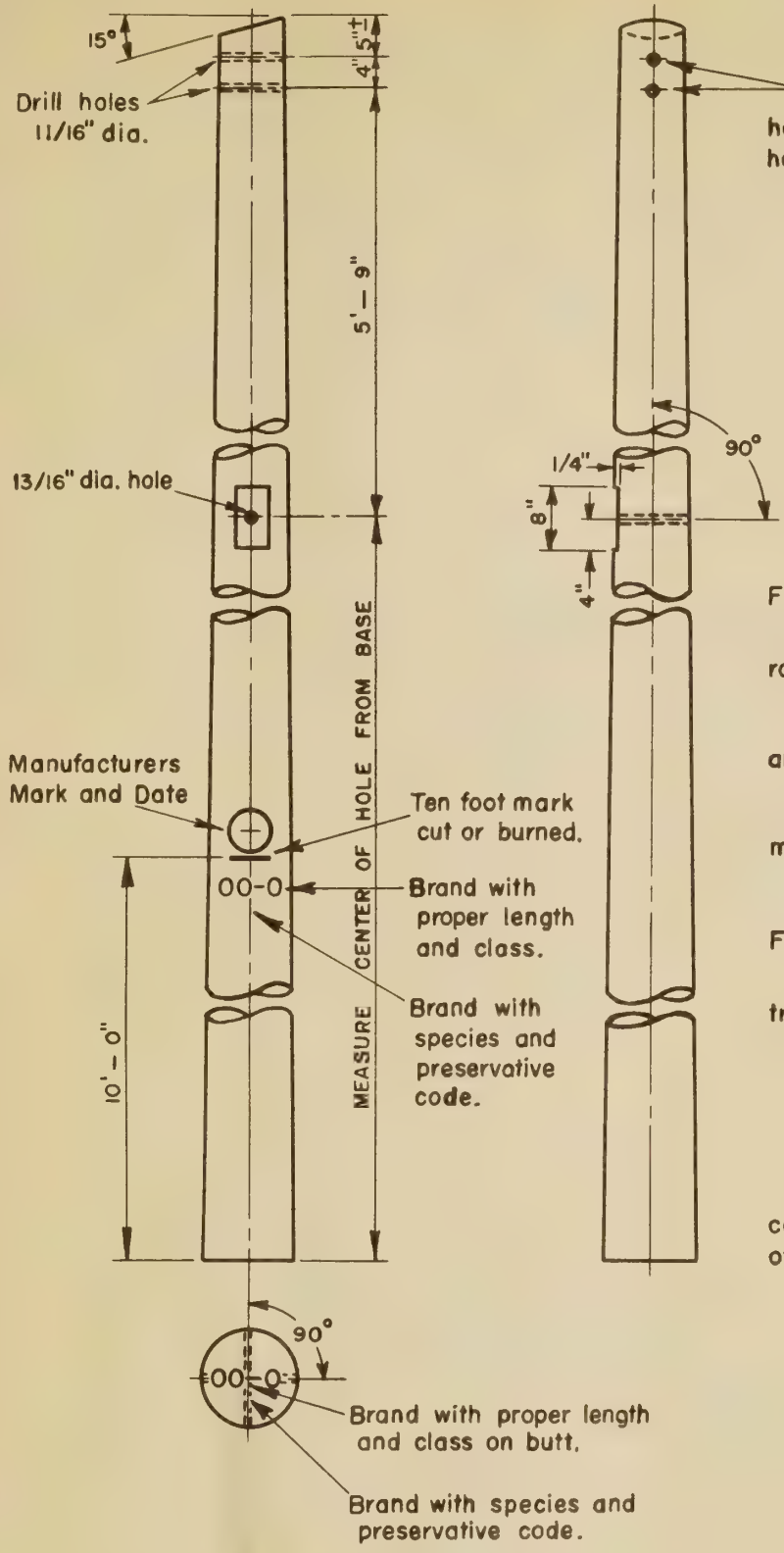
FLAT ROOF

Flat roofs may be cut on all full-length treated poles before treatment.

When metal disk is used for branding, center of disk must be ten feet from butt of pole.

TRANSMISSION LINE POLE FRAMING
FOR STRUCTURE TS-1

Scale: 1/2"=1'-0"		Date: 11-49
		TM-5



Overhead ground wire cable support holes must be at 90° angle with thru bolt holes.

FRAMING

All poles treated full length must be bored, roofed, and gained before treatment.

Gains are to be flat with plane at right angles to bolt holes.

For field gains on full length treated poles metal gains are preferred.

FLAT ROOF

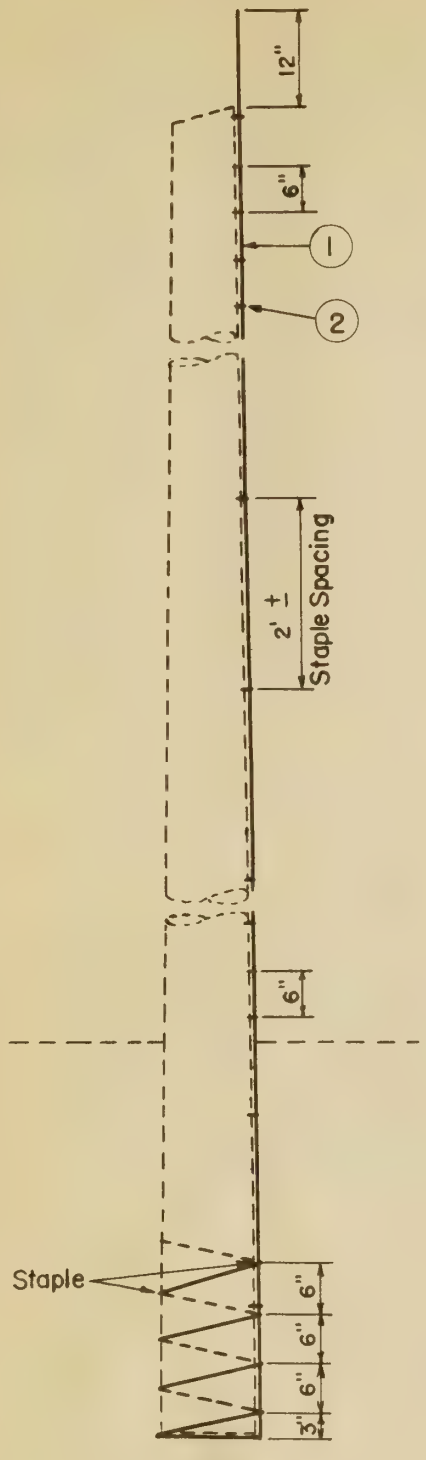
Flat roofs may be cut on all full-length treated poles before treatment.

When metal disk is used for branding, center of disk must be ten feet from butt of pole.

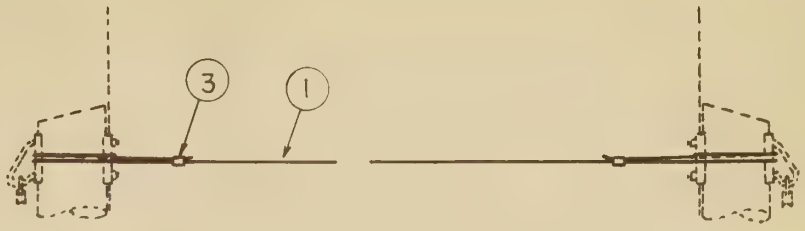
TRANSMISSION LINE POLE FRAMING

FOR STRUCTURES TH—1G AND TH—1A

Scale: 1/2"=1'-0"	Date: 11-49
	TM-5A



POLE GROUND
TM-9



TWO POLE TIE ASSEMBLY
TM-9A

NOTE

Staple downlead to pole leaving one foot projecting above pole. Carry downlead under bottom of pole and take four wraps back up pole with a staple at each wire crossing and on opposite side of pole.

Make one turn of downlead underneath washers around conductor support bolts and overhead ground wire support bolts as indicated on respective pole top assembly drawings.

On structures with crossarms staple downlead so that it does not come in contact with crossarms or through bolts, as indicated on respective pole top assembly drawings.

Staples on downlead shall be 2 feet apart, except for a distance of 8 feet above ground and 8 feet from top of pole where they shall be 6 inches apart.

LIST OF MATERIAL

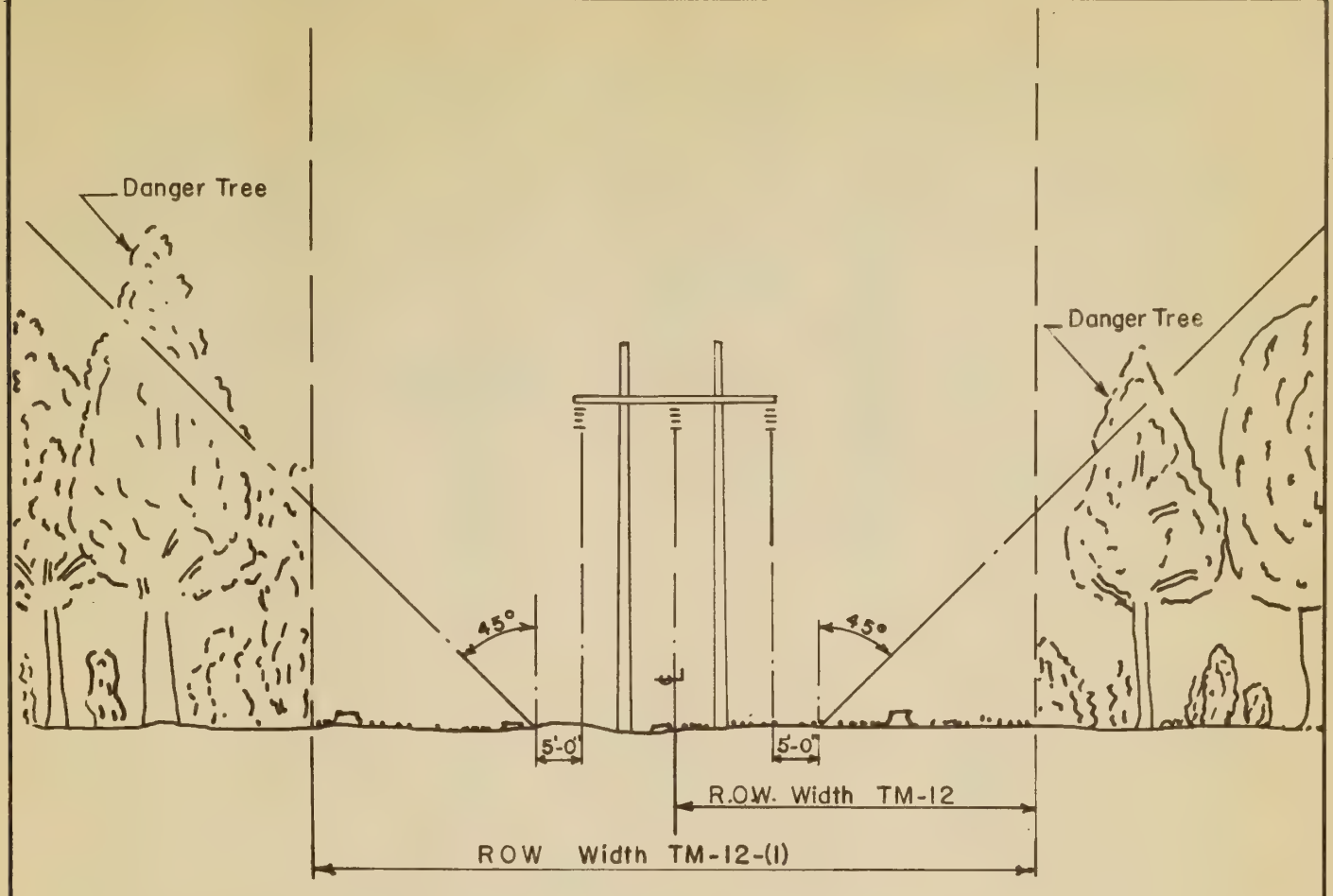
DR'G REF.	REQUIRED TM-9	REQUIRED TM-9A	DESCRIPTION	ITEM
1	'	'	No.6 AWG. Solid S.D. Copper or Copperweld Wire	cj
2	#		2" Copperweld or Galvanized Staples	al
3		2	Connectors	p

POLE GROUNDING ASSEMBLY

Scale: 1/2"=1'-0"

Date:

TM-9, 9A



NOTE:

Cut or top all danger trees (trees which would reach within five feet of a point underneath the outside conductor in falling).

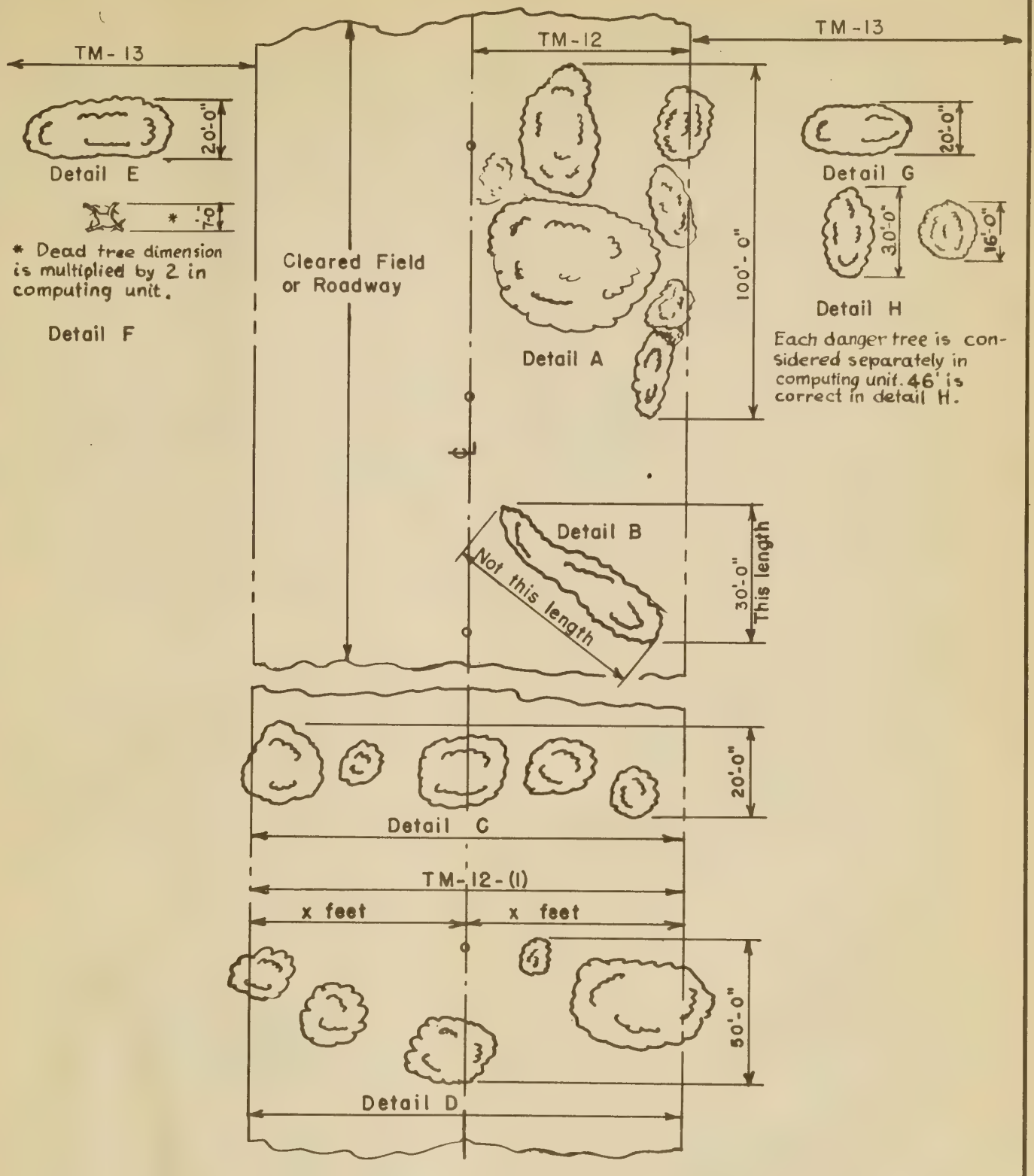
As directed by the engineer, portions of the right-of-way must be cut so that stumps will not prevent the passage of tractors and trucks along the right-of-way.

The bid unit for clearing right-of-way of specified width is TM-12 or TM-12-(1)

The unit for clearing danger trees is TM-13.

TRANSMISSION LINE
CLEARING RIGHT-OF-WAY GUIDE

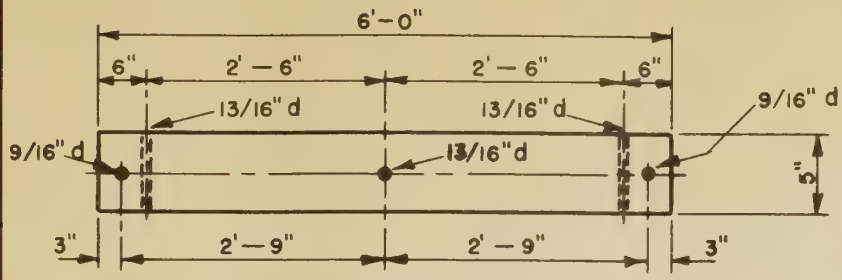
Scale: None		Date:
		TM-12,12-1,13



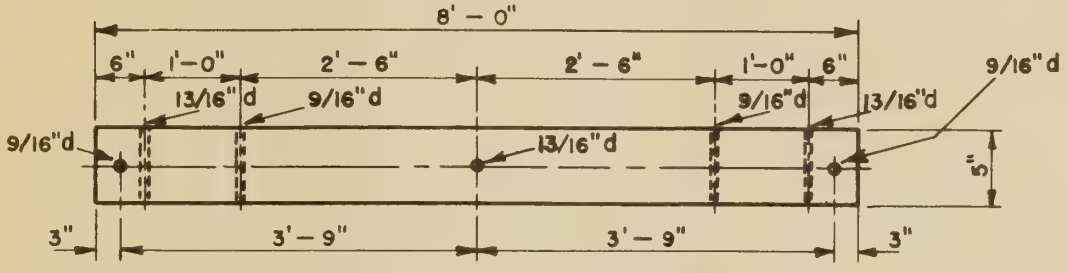
GUIDE

MEASURING RIGHT OF WAY CLEARING UNITS

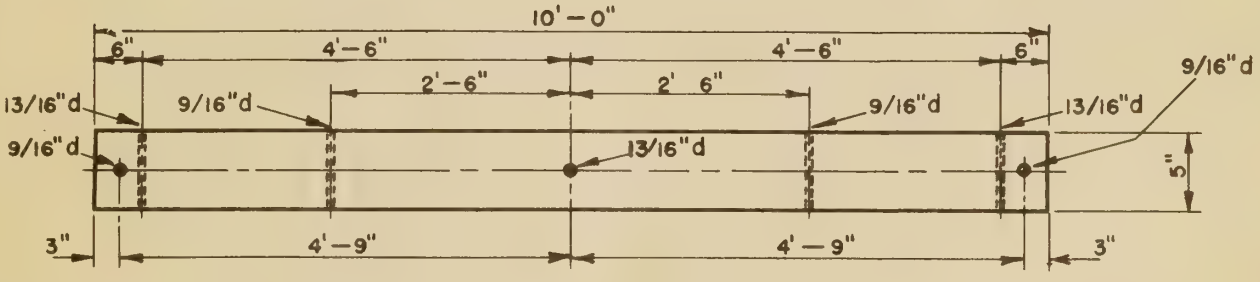
Scale: None		Date: 11-20-50
		TM-12-2A



FOR TP-5



FOR TP-1, TP-2, TP-3, TP-4, TP-5, TP-6

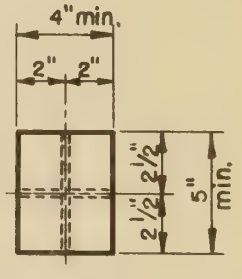


FOR TP-6

NOTE:

Drill all holes on center lines.
"d" denotes hole diameter.
Holes shall be drilled before treating.

TOLERANCES:	Over	Under
Length	1/4"	1/4"
Cross Section	1/8"	0.0"



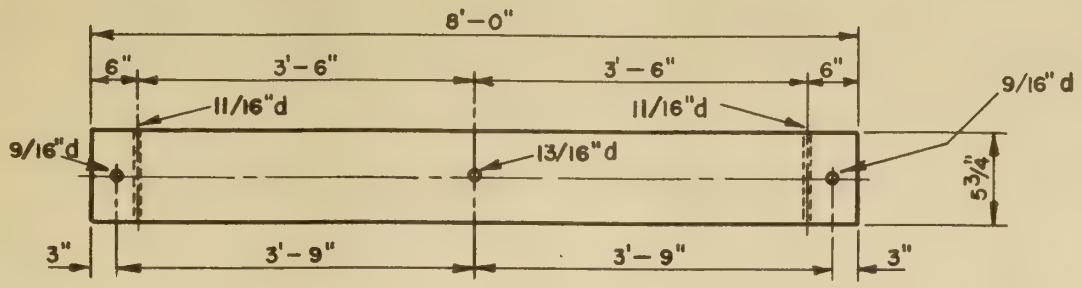
ENLARGED END VIEW
Surface Finished Dimensions

CROSSARM DRILLING GUIDE
FOR PIN TYPE STRUCTURES

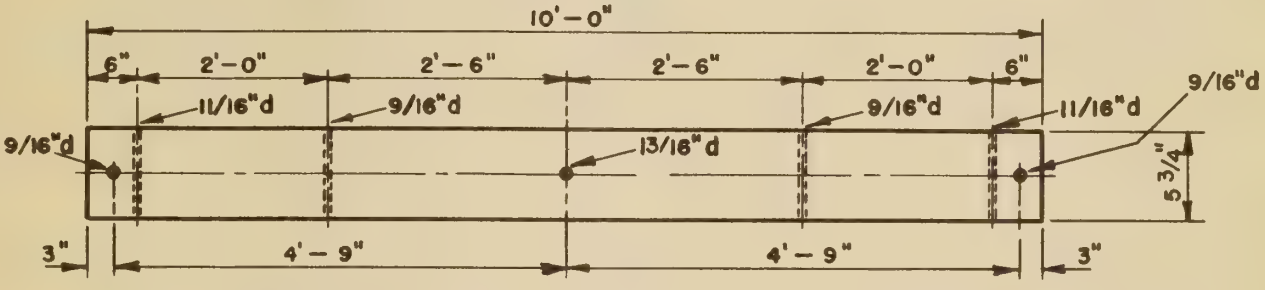
Scale: None

Date: 11-49

TM-20



FOR TS-1, TS-1B, TS-2, TS-6

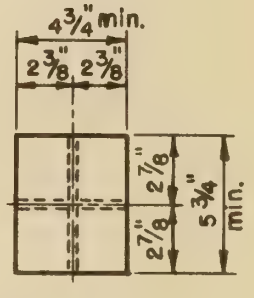


FOR TS-1, TS-1B, TS-2, TS-6, TS-7

NOTE:

Drill all holes on center lines.
"d" denotes hole diameter.
Holes shall be drilled before treating.

TOLERANCES:	Over	Under
Length	1/4"	1/4"
Cross Section	1/8"	0.0"

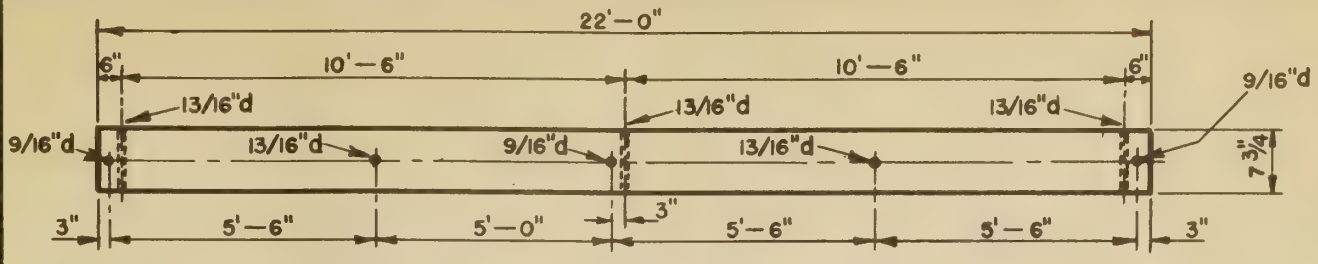


ENLARGED END VIEW
Surface Finished Dimensions

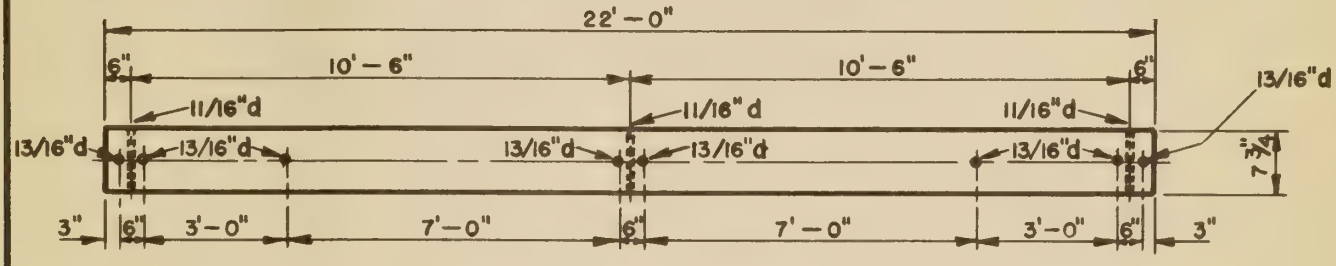
CROSSARM DRILLING GUIDE
FOR SINGLE POLE SUSPENSION STRUCTURES

Scale: None		Date: 11-49
		TM-21

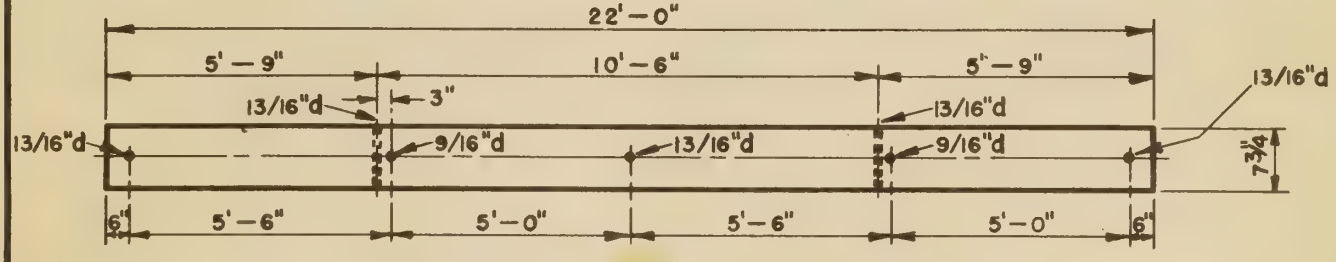
946698 O—51——7



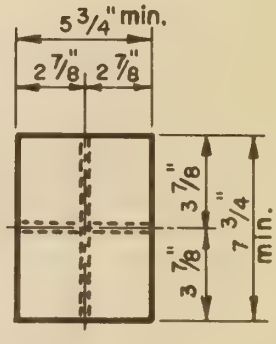
FOR TH-1, TH-1G, TH-1B, TH-1BG, TH-6, TH-3, TH-4



FOR TH-2, TH-2G



FOR TH-5



ENLARGED END VIEW
Surface Finished Dimensions

NOTE:

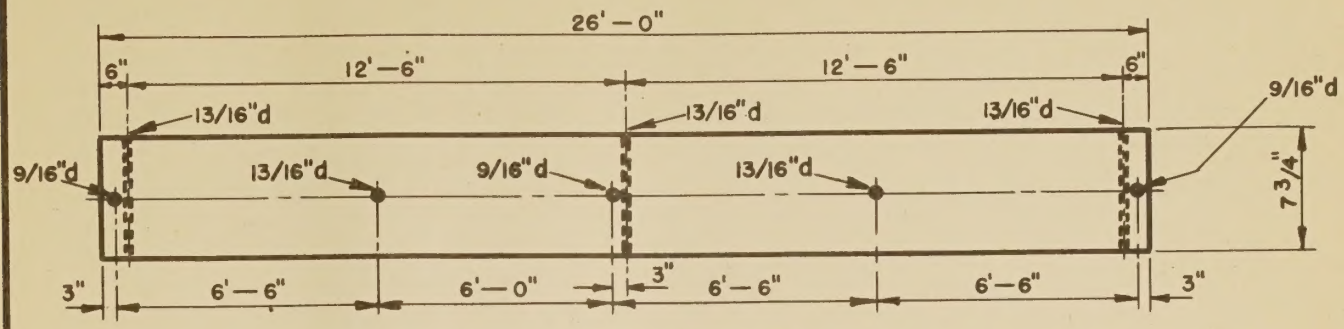
Drill all holes on center lines.
"d" denotes hole diameter.
Holes shall be drilled before treating.

TOLERANCES:	Over	Under
Length	1/4"	1/4"
Cross Section	1/8"	0.0"

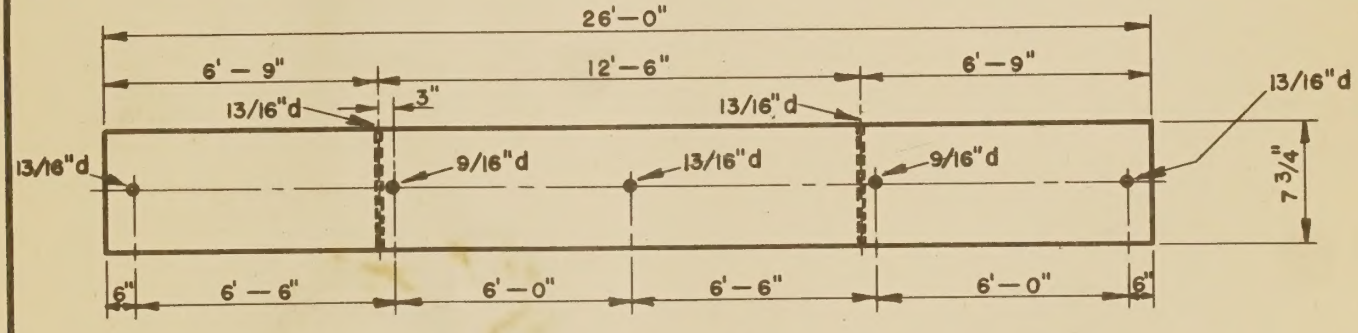
CROSSARM DRILLING GUIDE

FOR H-FRAME STRUCTURES WITH 10'-6" CONDUCTOR SPACING

Scale: None		Date: 11-49
		TM-22



FOR TH-1A, TH-2A, TH-3A, TH-4A

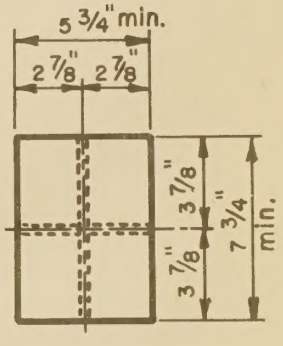


FOR TH-5A

NOTE:

Drill all holes on center lines.
"d" denotes hole diameter.
Holes shall be drilled before treating.

TOLERANCES:	Over	Under
Length	1/4"	1/4"
Cross Section	1/8"	0.0"



ENLARGED END VIEW
Surface Finished Dimensions

CROSSARM DRILLING GUIDE

FOR H-FRAME STRUCTURES WITH 12'-6" CONDUCTOR SPACING

Scale: None		Date: 11-49
		TM-23